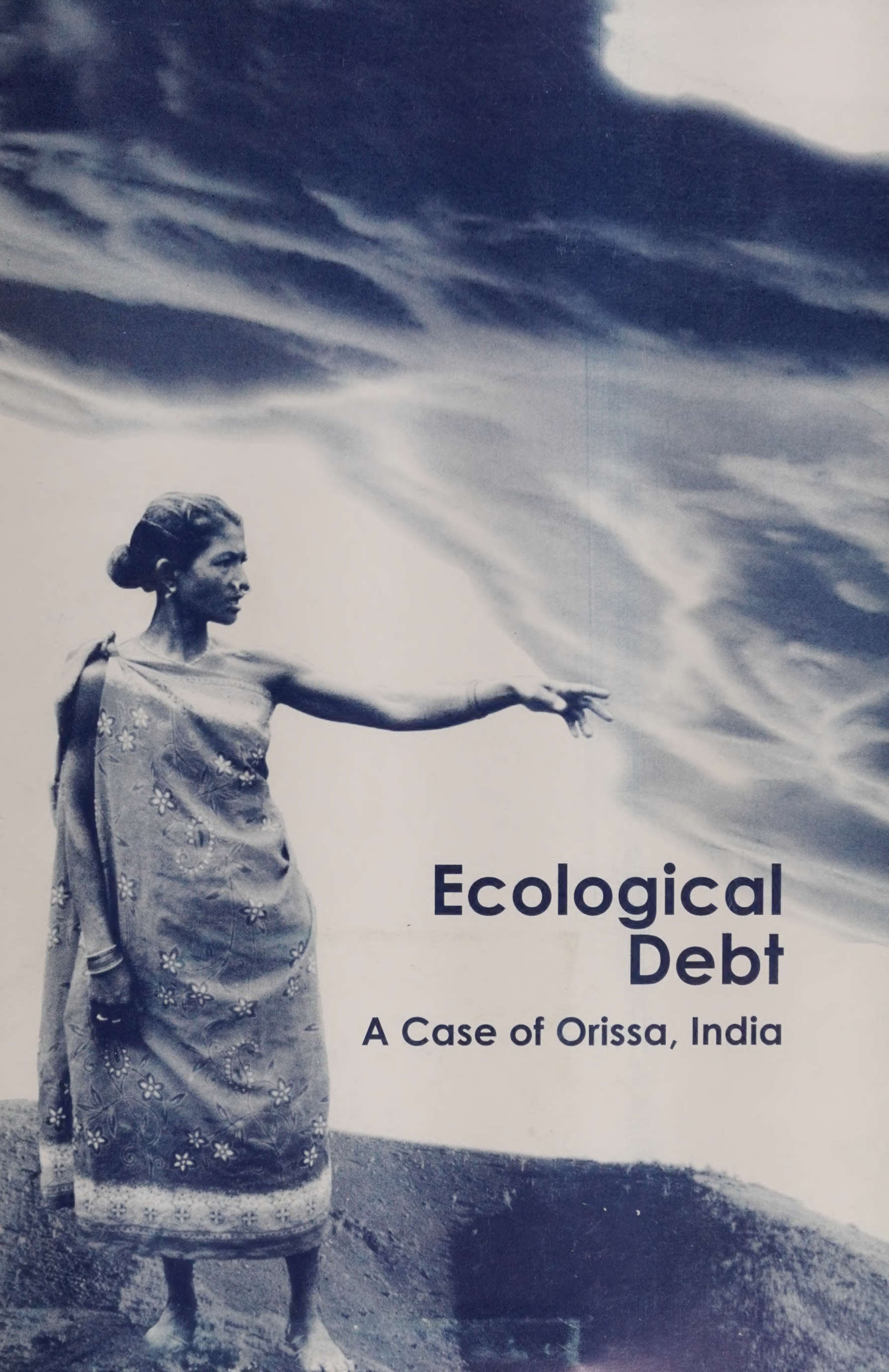

Ecological Debt

A Case of Orissa, India

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ECOLOGICAL DEBT
A CASE OF ORISSA, INDIA

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Integrated Rural Development of Weaker Sections in India

Ecological Debt: A Case of Orissa, India
is a revised version of the study published in
ECOLOGICAL DEBT
The Peoples of the South are the Creditors
Edited by Athena K. Peralta

The book containing
cases from Ecuador, Mozambique,
Brazil and India was published by
World Council of Churches in 2006

Ecological Debt: A Case of Orissa, India
Published by Integrated Rural Development of Weaker Sections in India

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CONTENTS

Dedicated
to the Victims
of Neo - Liberal Economy
and
Economic Globalisation

In Few Words

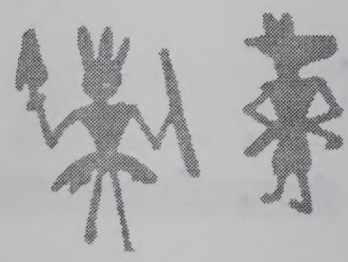
A woman, whose child had died , came to Goutam the Buddha and begged that he resurrect the child to life. Feeling deeply for her despair, the Buddha asked her to go to a village and bring back to him a handful of mustard seeds from a house where no one had died. She went from house to house looking for just one such home. After days, exhausted and worn, she returned back to the wise Buddha, by which time she had realized that death and suffering fall on all . Like the unfortunate mother, it will not be possible to find a mining area or industry in Orissa that does not adversely affect the common resources of the community and livelihood of people in the process of carrying out starklly profit-driven activities.

The State allows regional, national, and trans-national companies and corporations to promote and carry out mining and related industrial activities in the name of regional or national development and employment generation, etc. However, the ground realities present a picture, far different from the spelled out objectives. It would not require any rigorous research to find out that the indigenous communities arc displaced and dislodged from their occupation, culture and resource bases, because of abject exploitation of resources. To make the matter worse, due to the impact induced by the mining and related industries; the communities, who benefit little are subjected to spending sizeable amounts of hard-earned cash to deal with health, housing, drinking water and varieties of other problems. Even the livelihoods of the communities living far way from the 'mining-industry belt' suffer heavily under the chain impact.

The present study attempts at a simple reality check, relating to the implication of mining and allied industries in Orissa on the livelihood of the indigenous communities. It tries to get a sense out of the process of exploitation of ecological resources by the mining and industrial tnterests and what could be considered as an 'ecological debt'?. It would be worth the effort to the 'case' taht would contribute an understanding of the dynamics of 'ecological debt', and further appropriate community based sustainable management practices of natural resources where, the interest of the communities living in respective ecological niches come first.

We feel privileged while preparing the study for publication on behalf of the communities who made this case work happen. We take this opportunity to express our gratitude to ODAF, INECC, Dhara and the Civil Society Organisations, academicians, scientists, activists and the impacted communities for their participation in the process.

Dr. William Stanley **Sanjay Khatua**



INTRODUCTION TO ECOLOGICAL DEBT

Athena K. Peralta
World Council of Churches

Overview

Since the 1975 Assembly of the World Council of Churches in Nairobi, Kenya, ecumenical churches have been advocating for "just, sustainable and participatory societies" in affirmation of the integrity of God's creation and in recognition of the linkages between economic, social and environmental dimensions of life. Put in another way, the World Council of Churches asserts that struggles for socio-economic justice are inextricably intertwined with struggles for environmental justice such that, ultimately, one cannot be achieved without the other. It is in this vein that the World Council of Churches initiated the ecumenical programme on ecological debt as part of its overall work on globalisation and debt.

In contrast to the financial debt being claimed from many countries in the South at huge cost to its peoples, ecological debt refers to the responsibility held by Northern industrialised countries, including their collaborators in the South, for the continuing degradation of the earth as a result of their resource-intensive production and consumption patterns and the imposition of neoliberal "one size fits all" development models. Ecological debt is argued to be much larger than financial debt; and an important starting point for recognising and discharging ecological debt is the unconditional cancellation of Third World financial debt which was largely incurred under illegitimate

Excerpt from 'Introduction to Ecological Debt' from the book "Ecological Debt, The Peoples of the South are the Creditors" published by WCC in 2006.The author coordinates the Ecological Debt Programme of the Justice, Peace and Creation Team of the World Council of Churches.The whole text can be accessed at www.wcc-coe.org

or odious circumstances and has in any case been paid many times over.

While the problem of financial debt has been on the international development agenda for at least a couple of decades, ecological debt is a relatively new concept[1] that has received sparse political attention to date. Thus the World Council of Church's programme on ecological debt aims, first of all, to build awareness, provoke discussion as well as strengthen the processes for the recognition of ecological debt.

Defining ecological debt

Ecological debt is a broad and arguably fluid concept open to various interpretations and applications. Nonetheless, there have been several attempts to concretely define the term by non-government and civil society organisations conducting research and advocacy on economic and environmental justice[2].

According to Aurora Donoso (2002: 1-2) of Acción Ecológica, an Ecuadorian organisation at the forefront of ecological debt recognition and financial debt cancellation campaigns in Latin America, ecological debt is:

"...the accumulated, historical and current debt, which industrialised Northern countries - their institutions and corporations - owe to the countries of the South for having plundered and used their natural resources, exploited and impoverished their peoples, and systematically destroyed, devastated and contaminated their natural heritage and sources of sustenance...Industrialised countries are also responsible for the gradual destruction of the planet as a result of their patterns of production and consumption, and environmental pollution that generates the greenhouse effect".

Based on this definition, exploited peoples in the South are the principal creditors of the ecological debt, while the debtors are industrialised countries of the North. Needless to say, the concept of ecological debt offers a radical framework since it reverses traditional debtor and creditor positions of countries with potentially transformative implications for power relations between "rich" and "poor" countries.

Consistent with the view that ecology, society and economy cannot be delinked from each other, the concept of ecological debt has evolved social aspects, related to the disintegration of indigenous and peasant communities, deterioration in people's living conditions and loss of cultural heritage and values, among others. The consideration of social concerns in fact, serves to strengthen the position of Southern peoples as creditors.

Overall, however, ecological debt, in contrast to financial debt, remains difficult to pin down with precision. In part, this is because ecological debt is often incurred over long periods of time (sometimes over centuries) and indeed may be traced back to the early period of colonisation. It may involve something or some dimension of nature or culture which cannot be priced (perhaps precisely because it is so valuable). It has negative repercussions not only in the present but possibly far into the unforeseeable future[3].

Notwithstanding the above, there is a close association between ecological debt and financial debt that sheds light on the ways through which the former is accumulated through the latter.

The relationship between ecological and financial debt

There are several aspects to the relationship between ecological debt and financial debt (Martinez Alier, 1998). The first aspect deals with the undervaluation of exports and the occupation of environmental space. Such exports are actually extremely undervalued because the massive pollution caused by extraction, smelting, land clearing and pulp bleaching, among others, are not accounted for in the prices of these products. In economic parlance, the costs of pollution are "externalised".

The second aspect is closely related to the first and has to do with ways in which national obligations to pay external debt and its interest have resulted in environmental destruction (and therefore an increase in ecological debt). Under the current neoliberal trade and financial architecture, Southern countries are pressured through structural adjustment programmes or loan conditionalities, multilateral and bilateral trade agreements and other mechanisms to export more and more products in order to service their debt and interest payments. In other words, these countries are required to produce a surplus (i.e., production greater than national consumption) that comes largely from the impoverishment of populations as well as through the abuse of nature. Combined with the under pricing of exports and a global trend of rising interest rates, this has led to a situation described as "ecologically unequal exchange"[4] (Martinez Alier, Rijnhout and Simms, 2003). It is important to note that countries like India and Brazil are relatively "poor" and powerless such that they are unable to impose environmental taxes on their exports or diversify into other export products. It is equally important to note that while financial debt keeps on increasing through compound interest rates, the natural world is not able to grow at the same pace. The high interest rates that are engendered by the present global financial system therefore, serve to undervalue the future such that environmental concerns are discounted in favour of the present. The third aspect describes a more direct relationship between ecological debt and financial debt wherein, huge projects are financed through external lending by international financial institutions, with little consideration of their social and environmental consequences.

For all of the above reasons, the process of recognition of ecological debt demands, first of all, the annulment of the illegitimate financial debt held by Southern countries.

NOTES

1 The concept was first used by the Chilean non-government organisation (NGO) Instituto de Ecologia Politica (IEP) in 1992 as a counterargument to external financial debt (Paredis et al, 2004).

2 Paredis et al (2004) in a report entitled "Elaboration of the Concept of Ecological Debt" provide a comprehensive discussion on the definition of ecological debt.

3 It should be noted that some of these negative repercussions might not be obvious now. Hence, the "precautionary principle" has become prominent in debates on sustainability.It states that if the consequences of an action are unknown, but are judged to have some potential for major or irreversible negative consequences, then it is better to avoid that action.

4 This builds on Raul Prebisch's and Han Singer's (1950) declining terms of trade and unequal exchange theory that basically posits that countries in the South face structural deteriorating terms of trade for their (primarily) resource-intensive exports and therefore, have to export more and more, in order to meet their usual bill of imports.

I

Ecological Debt:

A Case of Orissa, India

"They [NALCO] told [us], we will educate you; we will give you jobs, you can wearpants like us, you can comfortably sit like us in chair[s]. You do not bother about anything, just give us some land. These people thought that we were illiterate and that we were scared. These people have made us fools. And slowly, different factories have come up in our place. What benefit it has given to us? It has only degraded our land, forests and streams. If we had [an] idea, we would not have given them our land, our forest, our water. We would not have given even a needlehead size of land to them".

Banguru Jani, Adivasi leader in Jhimkiguda, Damanjodi, Koraput, Orissa

INTRODUCTION

The high living standards of people in the industrialised Northern countries are built to a great extent on the massive flow of wealth from the developing countries of Africa, Latin America and Asia. That is, the impoverished countries of the South have subsidised and continue to subsidise the rich countries of the North, through the provision of raw materials, commodities, labour and other services.

The North comprises only about 25 percent of the world's population, yet consumes around 75 percent of global resources. Preexisting political and economic structures, the legacy of centuries of European colonialism, have resulted in a situation in which, the Northern countries, through the activity of Northern companies and the individual lifestyles of people in those countries, draw vast amount of resources from the Southern countries. Such draining out of basic resources and raw materials has put immense strain on the capacity of Southern countries in feeding their people. According to the United Nations Development Programme (UNDP, 1998), 20 percent of the world's population, living in the highest income countires make 86 percent of all consumer purchases. The richest one fifth of the population consume, 58 percent of the energy used by people globally. These richest countries also generate 53 percent of carbon dioxide emissions, while the poorest countries produce just three percent of the noxious gases. Against this background, the concept of ecological debt was coined by a South American non-governmental organisation in the nineties to refer to the responsibility of those, who live in the industrialised countries and their accomplices in the South, for the continuos destruction of our planet due to production and consumption patterns, driven by the neo-liberal global market economy. It further states that the exploited people of the South are the principal creditors of the ecological debt, while the ecological debtors are the world's wealthiest citizens. Yet, not only are these ecological debtors remain unaccountable, but also the international institutions and governments have yet to acknowledge and take appropriate curative measures to make good for the ecological debt. Meanwhile, the underdeveloped and developing countries are paying, over and over again, their financial debt to rich countries.

By looking closely at the example of mining in the state of Orissa in India, this work aims to explore ways of understanding the process and magnitude of ecological debt, its possible components and dimensions. When a corporation seeks to mine in a state, the government incurs substantial loans with the ostensible objectives of developing the region and creating employment, sadly enough though, at the expense of the environment. The loans allow the government to provide subsidies and develop infrastructure for the use of the corporations. For this and other reasons, a study of the concept of ecological debt would have implications for determining the issue of financial debt.

In the context of Orissa, where more than 80 percent of the population depend on local resources of land, water and forests, the concept of ecological debt could provide useful instruments for seeking redressal, fixing accountability, and enforcing compensation and restitution.

Objective

The study has the broad aim of elaborating on the social and ecological costs of large-scale mining, thereby contributing to a better understanding of the concept of ecological debt, from the perspective of predominantly natural resource based communities in Orissa. The study also has the specific objectives of, first, exploring the felt and perceived impact of mining and mining-based industries on the resource base, livelihood, and culture of local communities, and, second, of identifying the agencies responsible for all these adverse impacts, within the purview of both ecological debt and financial debt.

Focus

The study looks at the livelihood options and lifestyles of the affected communities, land use patterns, impact on natural resources and climatic change, in the context of mining. It attempts to describe about the mining scenario in Orissa and its effects, especially focusing on the National Aluminium Limited Company (NALCO) and its role in resource exploitation. NALCO, as a mining company is dependent on many additional industries and infrastructures, e.g. hydroelectric power projects, refineries, smelters, roads, rail systems and port facilities. Hence, the study attempts to find out as to how the relationships between each of these activities, contribute to the ecological debt.

Methodology

The study depended mostly on secondary data, i.e., published and unpublished research papers, documents and reports available on the mining industry in India. It followed the cases of existing and forthcoming mining and industrial bases in the state of Orissa, carried out field work and interview in the affected communities in selected pockets. The exploration of the case was preceded by a consultation of civil society groups, activists, researchers and academics on 13 August 2004 at the State capital of Bhubaneswar, in order to collate insights relating to potential aspects of ecological debt.

II

MINING AND FINANCIAL DEBT FROM THE PERSPECTIVE OF ORISSA

Mining India

Since 1947, India's mining industry has shown rapid growth. In the preplan period prior to 1950, India produced 24 types of minerals with a total value of US $ 23 million. Today, it produces 89 minerals, accounting for 3.5 percent of the country's gross domestic product and 11.5 percent of total industrial output. Public sector mines comprise 91 percent of the nation's total mineral value, even though 80 percent of mines are privately owned. By 1996-97, India had 3,488 mines. Of these, 563 were coal, 654 were metals and 2,271 were non-metals.

In 1990, with the restructuring of the Indian economy into an open economy, the mining sector was liberalised, making it easier for mine-owners to obtain permission for prospective mining. In March 1993, with the announcement of India's new National Mineral Policy, the mining sector was opened up to private initiative and investment. Between 1994 and 1999, restrictions on foreign equity participation in the mining sector were removed, in order to attract foreign capital and technology. Some 34 mining investment proposals from transnational corporations (TNCs) covering an area of 49,000 km^2 were approved by the national government. The setting up of the national Apex Advisory Committee to monitor and review the environmental aspects of mining activities was merely a formal gesture, as the Committee was chaired by the Mining Secretary and most of the members belonged to the mining lobby. In general, environmental expertise within government has always had weak representation, and there has been no space at all for representatives of grassroots groups and local communities.

Orissa's economy and crippling debt

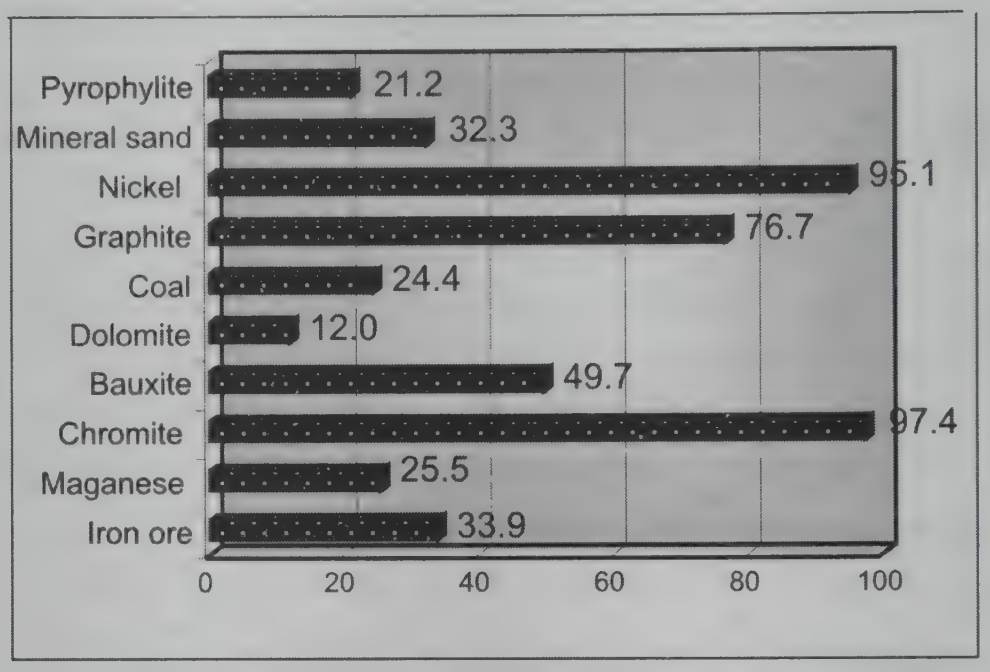
During the 49th National Development Council Meeting in New Delhi in 2001, the Chief Minister of Orissa (Pattanayak, 2001) noted: "The problem of economic backwardness of the State has assumed serious proportions. The long-term growth rate of the State's economy, during the period from 1951 to 1995 has been around 2.7 percent, which is substantially lower than the growth rate of the national economy. While the per capita income of Rs. 200 of the state during the year 1951-52 at current prices has gone up to Rs.9,162 during 1999-2000, showing an increase of 46 times, the national per capita income shows an increase of 65 times from Rs. 248 to Rs.16,047 during the corresponding period. The percentage of people living below the poverty line has decreased from 68.6 percent during 1972-73 to 47.15 percent in the case of Orissa, where as at national level, the same has declined from 48.3 to 26.1 percent, during the same period. More so, the percentage of people living under the poverty line for Orissa is the highest among all other states. This conveys a clear picture that poverty continues to be an intractable problem for the state of Orissa".

In 1999-2000, Orissa's revenue deficit reached the staggering figure of Rs. 2,573.87 crores or 6.5 percent of the gross state domestic product (GSDP) (Pattanayak, 2001). Currently, the state does not have funds to meet its salary, pension and interest payment and repayment liabilities since its total liabilities (Rs.7,733 crores in 2001-2002) exceeded its revenue receipts (Rs.7,511 crores). The ever-increasing gap between revenue expenditure and receipts was met through borrowing. The state's debt stock as of March 2001 stood at Rs. 21,072 crores or 51 percent of the GSDP. Almost 73 percent of Orissa's revenue went to servicing of this debt. Consequently, spending on education and other social services declined from 40 percent of the total State expenditure in 2000 to 24 percent in 2004. Likewise, expenditure on agriculture decreased from six percent of total State expenditure to two percent, while spending on rural development fell from 12 to seven percent in the same period.

Mineral base, production and export

In this context, mining has become one of the focuses of the Government of Orissa to raise revenue. According to its Economic Survey (Government of Orissa, 2004): "Though Orissa is rich in minerals, exploitation is still not commensurate with the potential. Enhanced rate of exploitation of different mineral reserves will not only improve the financial position of the State but also will be helpful in generating sizeable direct and indirect employment".

Figure 1. Orissa's mineral reserves (percentage to national level)



Source: Economic Survey,Government of Orissa (2005)

Orissa has 97 percent of India's chromite and 95 percent of nickel reserves, 50 percent of its bauxite, and 24 percent of coal reserves (Government of Orissa, 2005). Overall, it has an estimated reserve of about 5,923 million tons of 18 minerals, valued at Rs.1,674 million in 1996.

Growth of Mining and Industries

The notable projects in the fifties were the Rourkela Steel Plant and Hirakud Multipurpose Dam. The Hindustan Aeronautics Limited, Talcher Thermal Power Station and the Balimela Dam came up in the sixties. The seventies saw the establishment of the Rengali, Upper Kolab, Upper Indravati and Subarnarekha Multipurpose Dams. The Ib Thermal Power Station, Talcher Super Thermal Power Prioject and the National Aluminium Company were set up in the eighties. Along with these mega projects, open cast mining operations also began in the state in the sixties.

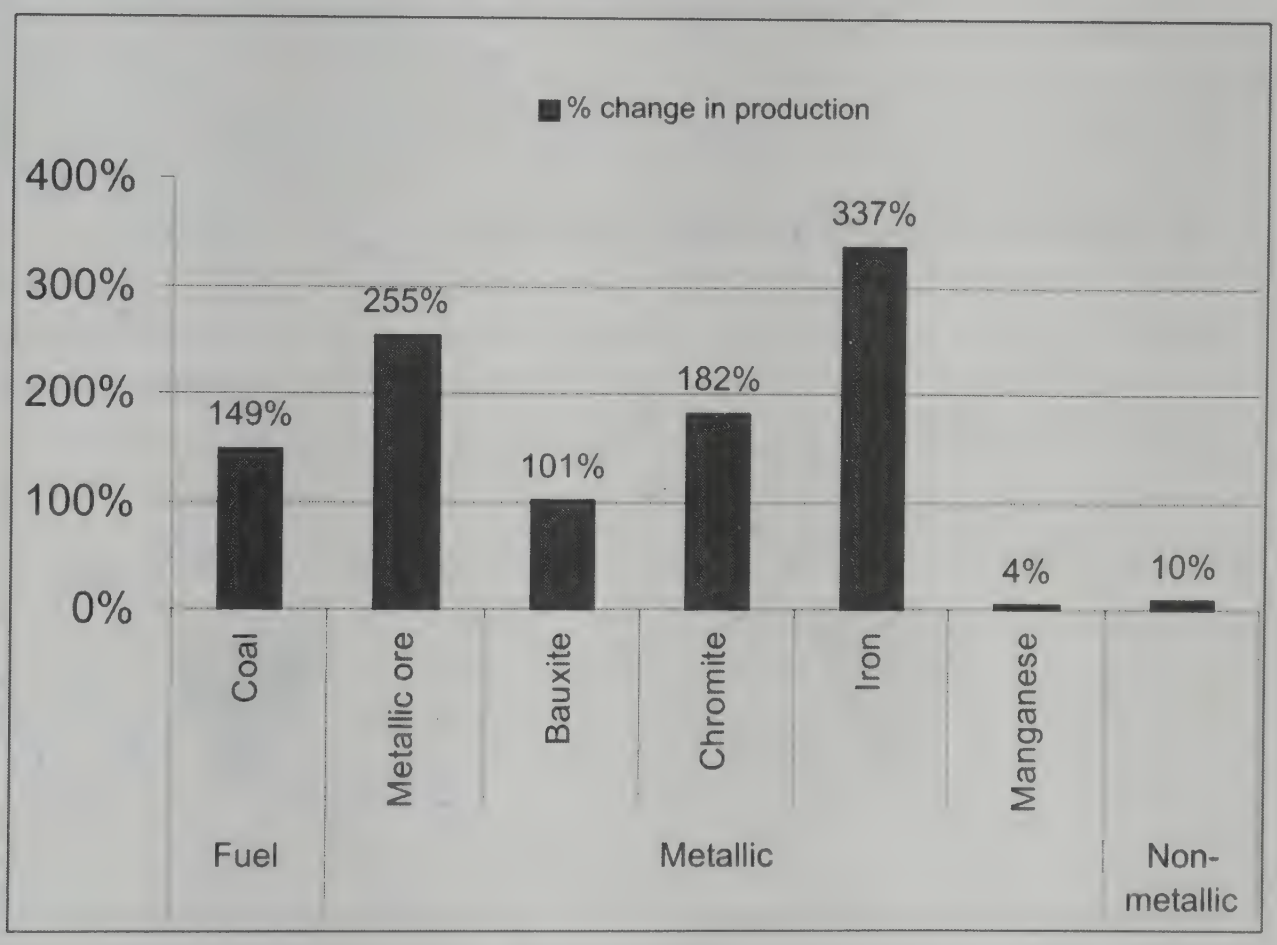
Mining in Orissa started in 1857 in Talcher, which has the dubious distinction of beingone of the 14 most polluted industrial zones in India. Some 370 mining companies are active in Orissa, including the public sector undertakings such as NALCO, Steel Authority of India, Mahanadi Coalfields

Limited, Orissa Mining Corporation, and the private mining companies. The total number of mining leases in the state by 2004 numbered 607, covering an area of 101,947 hectares. Out of these, 339 leases covering an area of 73,910 hectares were in operation, that included the extraction of bauxite, iron ore, chromite and manganese (Economic Survey, Government of Orissa, 2005).

Mineral production in Orissa is increasing. Between 1993 and 2003, there was a phenomenal 278 percent growth in mining and quarrying (from Rs.7,005 to Rs.19,489 million) even as production in the agriculture, animal husbandry, forestry and fishing sector fell by 16 percent -from Rs.71,625 to Rs.60,866 million in the same period. (Economic Survey, Government of Orissa, various years).

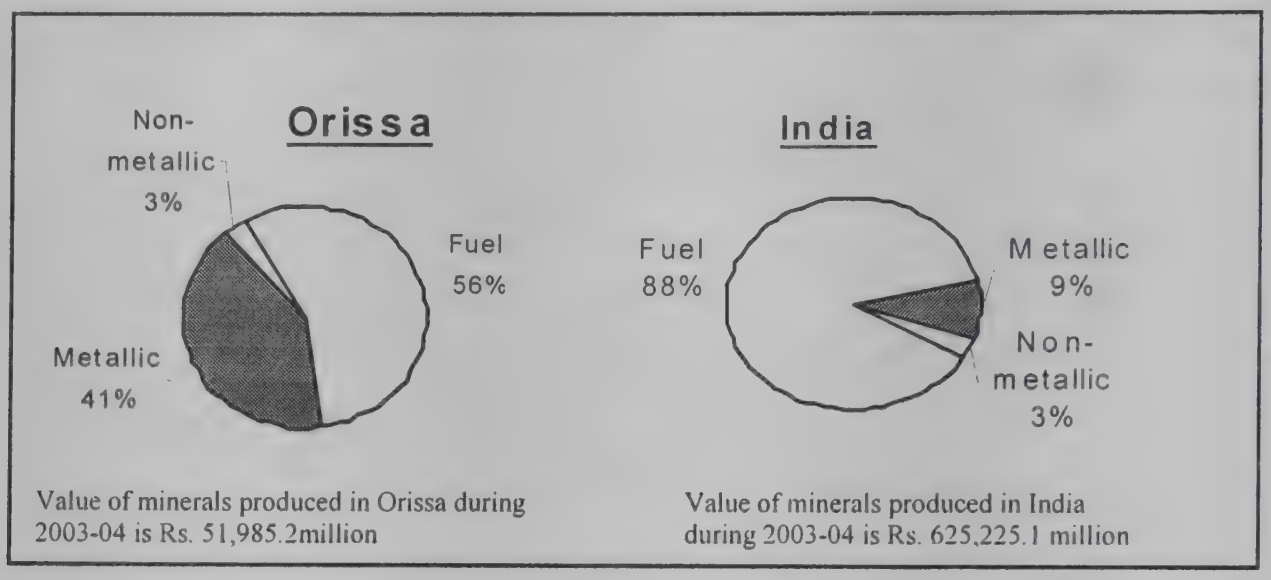
In 2003-04, the total production of minerals and ores was 108,283 million tons - an astounding increase of 171 percent from the 1992-93 levels (Economic Survey, Government of Orissa, various years). Iron ore registered the highest growth in production (337%), followed by chromite (182%) and bauxite (101%). The value of minerals and ore production in Orissa was the highest in the country, constituting eight percent of the national total (Rs.625,255 million). Orissa is followed by Gujarat (8.07%), Andhra Pradesh (6.77%) and Madhya Pradesh (6.28%).

Figure 2. Growth in mineral extraction, Orissa, 1993-94 and 2003-04



Source: Economic Survey, Governmnet of Orissa (various years)

Figure 3. Contribution to total value of mineral production, Orissa/ India 2003-04

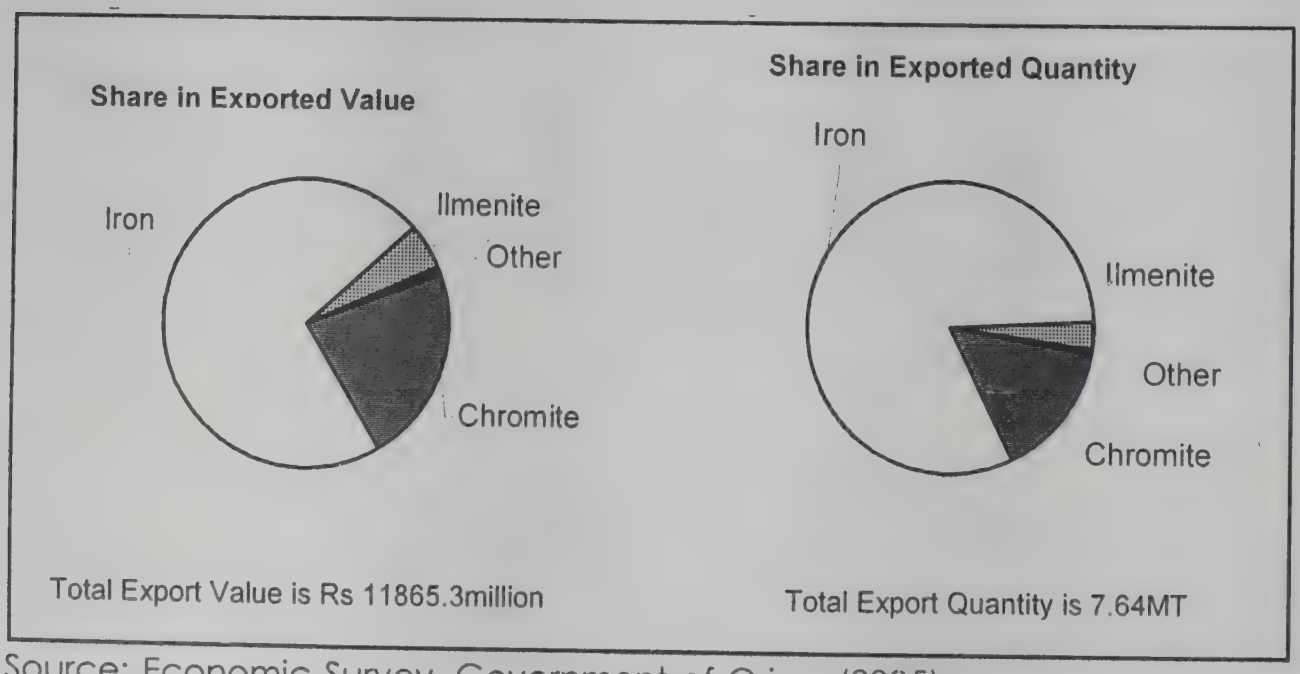


Source: Economic Survey,Government of Orissa (2005)

Of the total value of the minerals produced in Orissa, the share of coal is 56 percent and the shares of metallic and non-metallic minerals are 41 percent and three percent, respectively. The picture at the national level is quite different. Of the total value of minerals produced in the country, coal comprises 88 percent; metallic minerals, nine percent; and non-metallic minerals, stands at three percent.

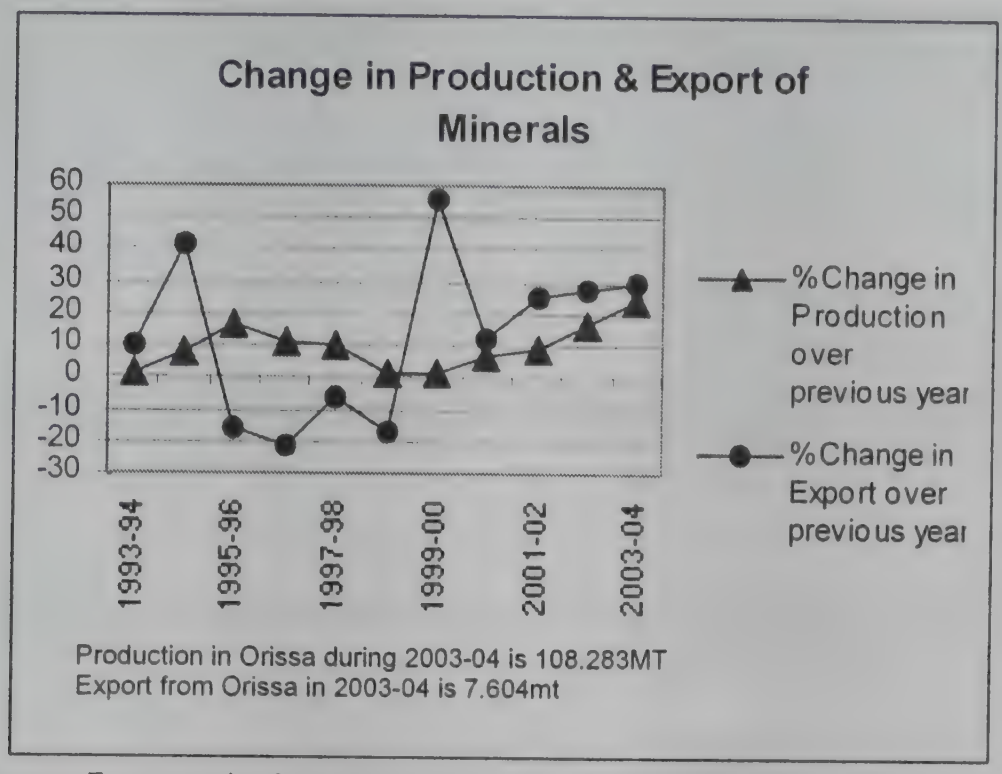
In 2003-04, Orissa exported 7.64 million tons of minerals and ores, valued at Rs.11,865 million, representing a 321 and 206 percent growth in quantity and value, respectively, over the period 1999-2000. Of the total quantity of minerals exported, iron ore constituted 81 percent, followed by chromite (15 percent) (Economic Survey,

Figure 4. Mineral export, Orissa, 2003-04



Source: Economic Survey, Government of Orissa (2005)

Figure 5. Mineral production and export, Orissa, 2003-04



Source: Economic Survey, Government of Orissa (various years)

Government of Orissa, 2004). Overall, the last decade (1993-94 to 2003-04) saw a 167 percent increase in mineral production and a 329 percent growth in mineral export (ibid).

TNC mining and mining related ventures

With its abundant natural resources, Orissa attracts TNCs and big businesses (e.g. Aluminium Peshiney International of France, Norske Hydro of Norway, Alcan of Canada, Alu Sussie of Switzerland, Broken Hill Propriety-Billiton and Rio Tinto of Australia; Vedanta, Sterlite and Alcoa of the United States of America and NALCO, Hindalco, Larsen and Toubro, Utkal Aluminium International Limited, Aditya Birla, and Tata Group of India) in mining, steel, aluminium and coal-based power projects. Besides the availability of cheap labour, the Government of Orissa offers exceptionally huge subsidies to investors in the form of guarantees and tax concessions. In 1995-96, Orissa received the largest amount of private investments in India, both foreign and domestic, followed by Gujarat, Karnataka and Maharastra. The state currently ranks sixth in terms of foreign investment, having attracted Rs.973,000 million in investments in the last five years.

Projects worth Rs.2,500,000 million are envisioned to be implemented in the state in the next five to ten years, the majority being mining and mining related ventures. In particular, 42 steel plants are poised to come up in Orissa, requiring

Table 1. G7 Investment in Orissa in the last five years

Country	Investment
USA	US $ 232 million towards the Ib Valley Coal-fired Power Plant (an additional US $ 75 million is in the pipeline)
France	US $ 607 million towards the construction of an aluminium smelting complex, NALCO, the Kaniha and Ib Valley Coal-fired Power Plants
Japan	US $ 125 million for coal mining expansion
UK	US $ 40 million for the upgrading of the Hirakud Dam and an additional US $ 75 million toward the privatisation of the power sector in the State

Source: Government of Orissa (2004)

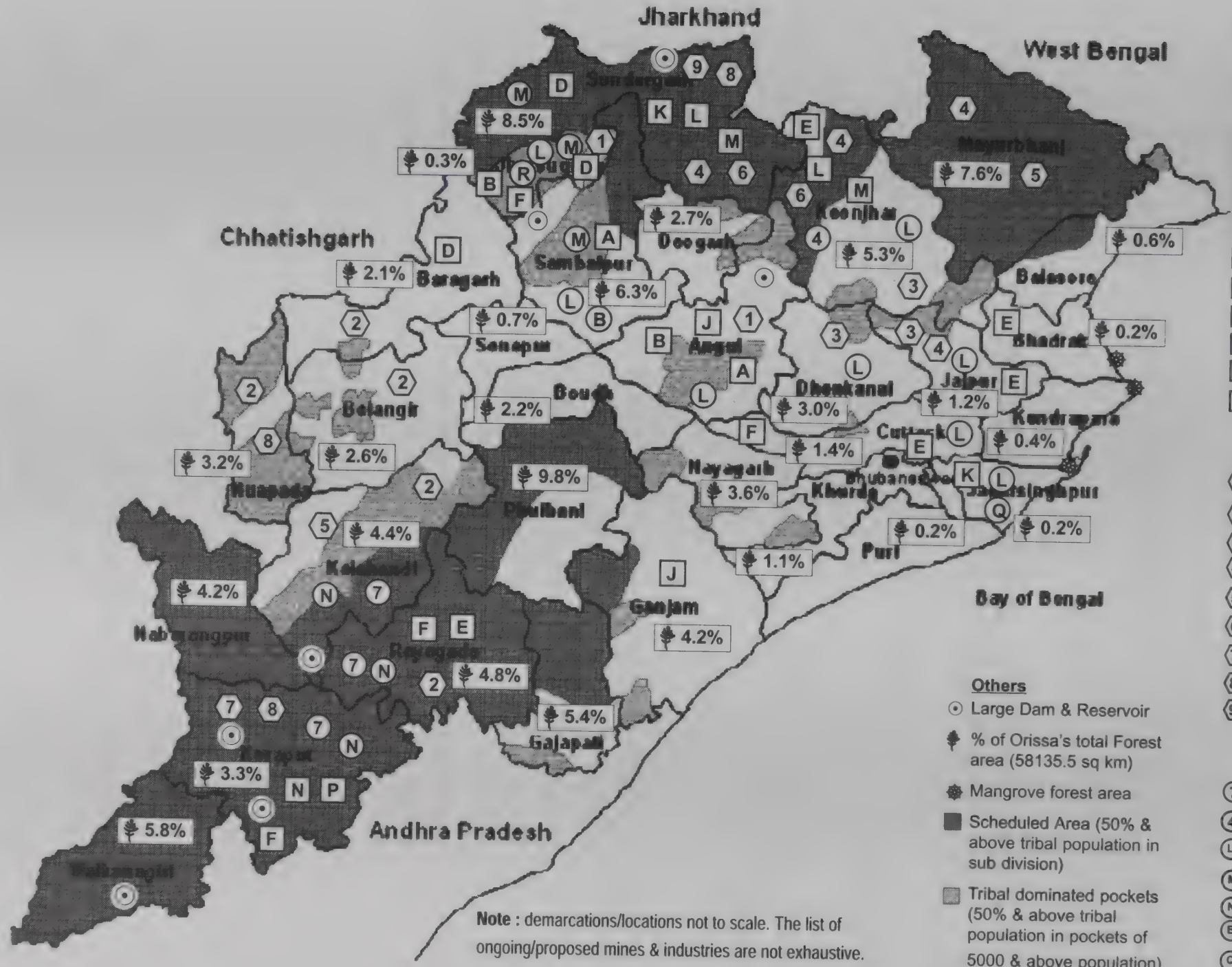
Mineral Map of Orissa

- Central Orissa on the bank of river Mahanadi, which includes Anugul, Jharsuguda and Sundergarh districts, is known as the coal belt, where about 1/3 of the coal deposit of the country is located.
- The Sukinda Valley, Keonjhar district, part of Mayurbhanj and part of Sundargarh districts are known as the chromite, iron and manganese ore belt.
- Southwest Orissa, which includes Koraput, Rayagada, Bolangir and Kalahandi, is know as the Bauxite Belt, having about 70 percent of the bauxite deposit of the country.
- Coastal Orissa has deposits of mineral sands and rare earth.

some 1,600 million tons of iron ore (or half of the State's known reserves). The state is currently leasing out mines containing 1,000 million tons of bauxite ore (or nearly 60% of its known reserves) to prospective entrepreneurs through the State owned Orissa Mining Corporation on condition that they will set up aluminium industries in Orissa.

It is important to point out that investment in mining is unsustainable for long since, minerals are exhaustible. Once the mineral ore is exhausted, the company has to leave. At the current rate of exploitation, Orissa's mineral reserves are conservatively expected to last as follows: chromite, 38 years; iron ore, 120 years; graphite, 153 years; manganese, 166 years; bauxite, 310 years; and coal, 857 years.

Map 1. Location of major mines and allied industries in Orissa



Note : demarcations/locations not to scale. The list of ongoing/proposed mines & industries are not exhaustive.

Legends

Present Major Industry

- A Aluminium Smelter & Captive Power Plant
- B Thermal Power Plant
- J Chemical Industry
- D Cement Industry
- E Ferro-alloys Plant
- F Paper Industry
- K Fertlilizer Plant
- L Steel Plant
- M Sponge Iron Plant
- N Aluminium Refinary
- P Aeronotical Industry

Ongoing Major Mining

- (1) Coal
- (2) Graphite
- (3) Chromite
- (4) Iron ore
- (5) Quartazite
- (6) Manganese
- (7) Bauxite
- (8) Limestone
- (9) Dolomite

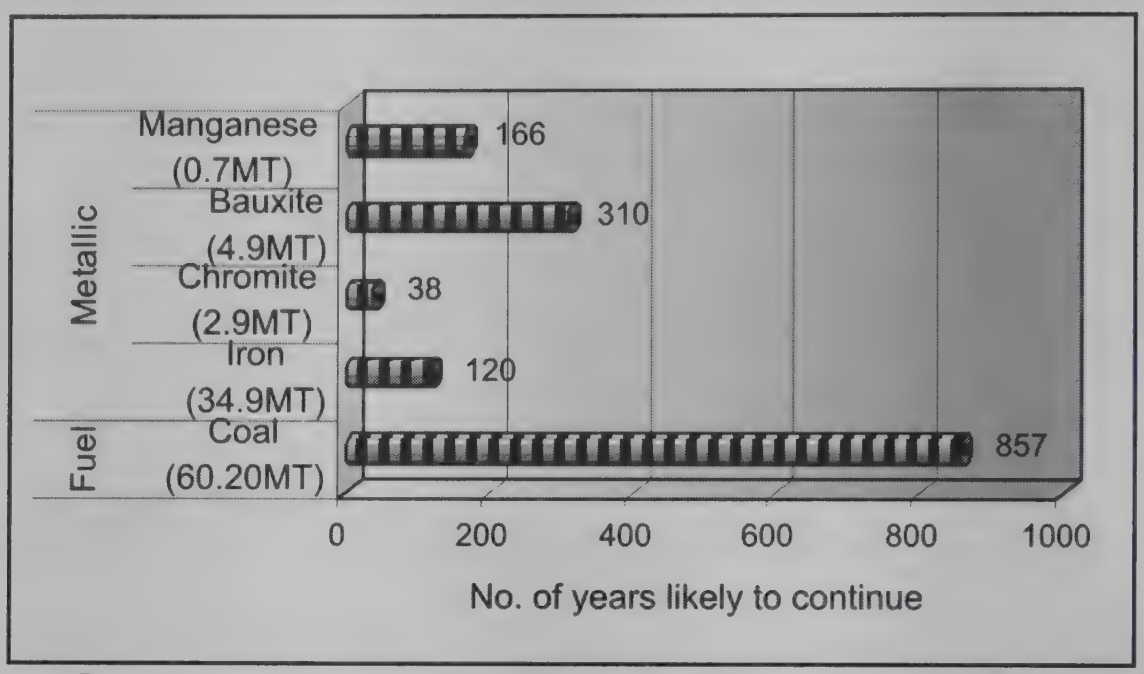
Others

- Large Dam & Reservoir
- % of Orissa's total Forest area (58135.5 sq km)
- Mangrove forest area
- Scheduled Area (50% & above tribal population in sub division)
- Tribal dominated pockets (50% & above tribal population in pockets of 5000 & above population)

Proposed Projects

- (7) Bauxite mining
- (4) Iron ore mining
- (L) Steel Plant
- (M) Sponge Iron Plant
- (N) Aluminium Refinary
- (B) Thermal Power Plant
- (Q) Petroleum Refinary

Figure 6. Life span of major mineral resources at present rate of extraction, Orissa



Source : Department of Mining and Geology, Government of Orissa (2005)

Summary

The Government of Orissa has actively promoted transnational and national interests for the exploitation of the State's mineral resources, based on the stated objectives of development and employment generation. The production and export of minerals have indeed contributed to the State's revenue kitty, needed to meet the budgetary deficits and to service it's debt obligations. On the surface, the State's preoccupation of increased dependency on mineral exploitation and allied activities may be justifiable. But is it sustainable? Does the generation of revenue from mining and allied activities take into account the consequential social and environmental costs that constitute a social and ecological debt to the people of Orissa? The next part of the analysis attempts to respond to these questions.

III

MINING AND ECOLOGICAL & SOCIAL DEBT

Ecological and social profile of Orissa

Orissa, one of the states on the eastern coast of India, comprises five percent of India's landmass; and with 36.71 million people, accounts for four percent of the population of the country. While more than two-thirds of the area is comprised of hilly forests, it has a coastline of 480 km.

The state's estimated fresh water resources are one of the highest in the country (11 percent of India's total surface water resource). Orissa has 6,63,774 hectares of fresh water sources. Eighty one percent of the States' rainfall is received during the monsoon (June- September). The brackish water areas of the state include the Chilika lagoon- 79,000 hectares; estuaries- 2,79,000 hectares and back waters - 8,100 hectares. Orissa has 3,678 inland fishing villages with 122,553 households and a population of 751,356.

Nearly 85 percent of Orissa's population live in the rural areas and depend mostly on agriculture, fishing, livestock rearing for livelihood. Officially, only about 34 percent of the irrigable land benefit from irrigation facilities. Hence, in the hill and forested tracts, rain-fed agriculture and forest produce collection are the primary sources of livelihood.

Of the total families who own land, 82 percent are marginal farmers (possessing less than one hectare of land) or small farmers (one to two hectares). Among the Dalits, landowning families constitute 91 percent and among the Adivasis,

it is estimated to be 80 percent. At the state level, 47 percent of families live below the poverty line (or earns an annual income of less than Rs.11,000). Given this profile, it does not require any academic discussion or complex analysis to establish that, in the case of Orissa, most of the communities till today have been earning their livelihood based on the multiple products and services, available in their ecological niches.

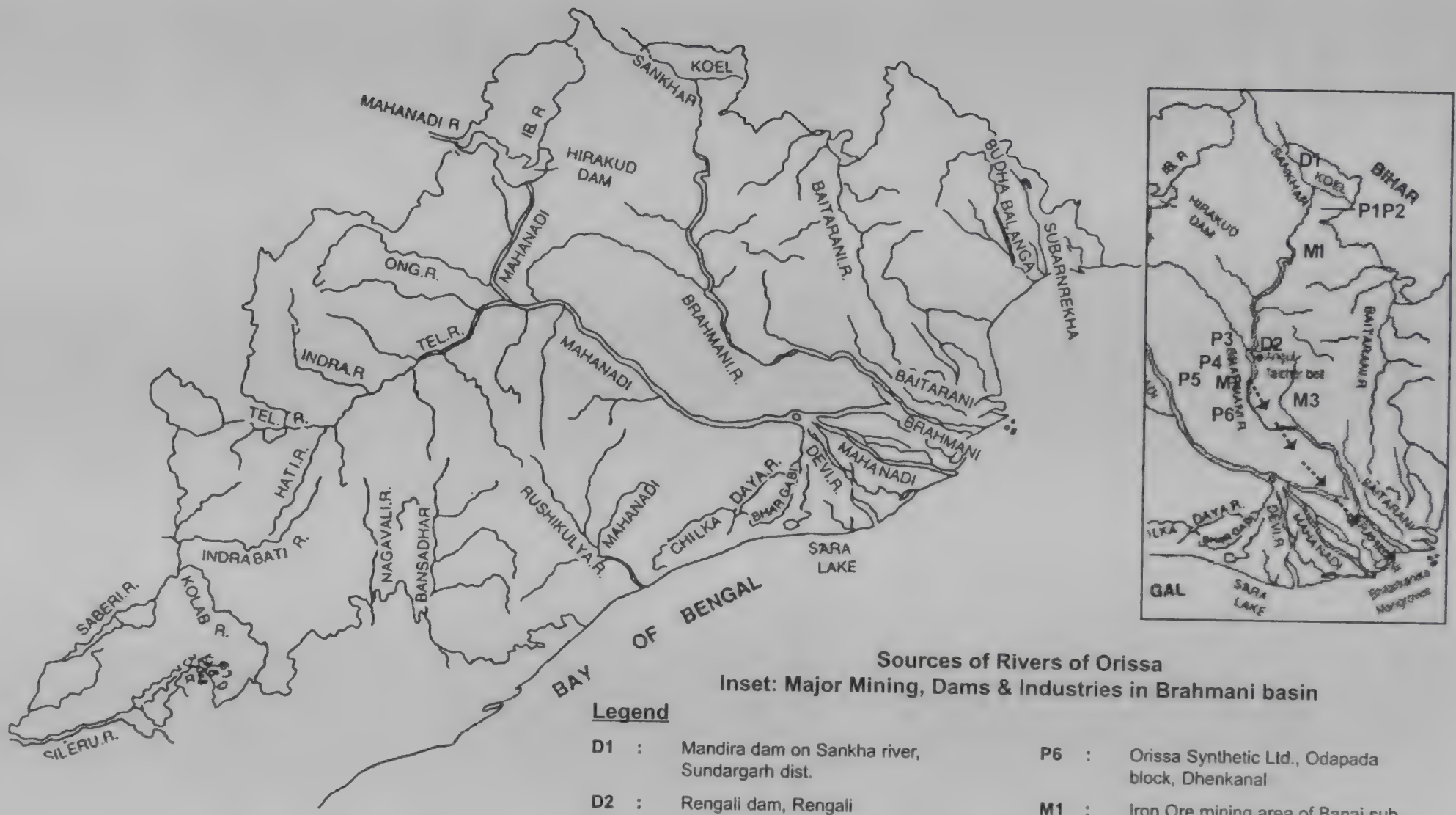
Orissa's environment and social fabric are severely threatened by large-scale mining and industrial activities that are expected to further intensify in coming years. Presently, the greenhouse gas emmission of the State is about one percent of the global emissions . Going by the current rate of acceleration a sharp rise in the emssion of greenhouse gas is inevitable. Beside causing drastic climatic changes and decline in wildlife habitats, mining in Orissa has displaced and undermined the usual way of life of thousands of Adivasis. It deprives the future generations of the benefits of the State's mineral resources. By allowing mining interests to exhaust the resources very fast, the government is violating the principle of inter-generational equity, as laid down by the Supreme Court of India.

The ecological debt

Pollution of the Bramhani river

The Bramhani, with a catchment area of 39,000 km^2 and a length of 701 km, is the second largest river of Orissa. As a result of large-scale mining operations, it is also one of the most polluted rivers in the State and one of the ten most polluted rivers in the country. At the upper reach, the river is polluted by the effluents of Rourkela Steel Plant, Rourkela Fertilizer Plant and the iron ore-mining industries of the Bonai subdivision. The pollution level further increases at the middle section, due to drainage from the coal belts and industrial wastes from the Angul-Talcher region mainly carried by its tributary, river Nandira, that flows through the industrial region of Angul-Talcher. Downstream, the Bramhani river is polluted by mine discharges from the Sukinda belt and industrial activities in Duburi. Damasala river, a major tributary downstream, carries toxic effluents from chromium mining fields (mainly hexavalent chromium) in the Sukinda Valley into the Brahmani. To make matters worse, flood water has been reduced in the Bramhani river, following the construction of the Rengali Dam which caters to the needs of the industrial belt. The pollution of the Bramhani river has tremendous implications for the livelihood of the fishermen and farmers as well as the health of communities living along the river, as is discussed in the section on mining and social debt.

Map 2. Major mining / industries in the Bramhani River Basin



Sources of Rivers of Orissa
Inset: Major Mining, Dams & Industries in Brahmani basin

Legend

D1	:	Mandira dam on Sankha river, Sundargarh dist.
D2	:	Rengali dam, Rengali
P1	:	Steel Plant & Captive Power Plant 1 & 2, Rourkela
P2	:	Fertilizer Plant, Rourkela
P3	:	National Thermal Power Corp., Kaniha
P4	:	Talcher Thermal Power Station, Talcher
P5	:	Aluminium Smelter & Coal based Captive Power Plant, NALCO, Angul
P6	:	Orissa Synthetic Ltd., Odapada block, Dhenkanal
M1	:	Iron Ore mining area of Banai sub-division (Barasuan, Koida, Jamda, etc)
M2	:	Coal mining area, Talcher
M3	:	Chromite mining area, Sukinda valley
----→	:	Major affected area (water not fit for irrigation/human/livestock consumption, livelihood of fishing community badly affected, mangroves in coastal cyclone prone areas affected

Source: Government of Orissa (various years) and Sinha (1999)

Climate change and natural disaster

According to a study by the Institute for Policy Studies (Wysham, 2003), greenhouse gas emissions from Orissa make up nearly to one percent of the global emissions. The study further points out that Orissa's industries and coal-fired power plants would have emitted 164 million tons of carbon dioxide annually by the year 2005, or the equivalent of about three percent of the projected growth in man-made greenhouse gases anticipated globally over the next decade. Moreover, it is estimated that the State's aluminium industries would release toxic and potent global warming agents, tetrafluorothemethane (TFM) and hexhafluoroethane (HFE), equivalent to eight million tons of carbon dioxide emissions, which, because it can stay in the atmosphere for 10,000 years, would be major factor of "perpetual change" in the earth's atmosphere. Orissa's aluminium industries also draw power from the multi-purpose dam projects (e.g. Rengali, Upper Kolab, Machkund and Balimela) that are now known to be sources of greenhouse gas emissions.

Some important facts about bauxite mining, the aluminium industry and climate change

- The percentage of coal produced in Orissa and consumed in alumina companies: 33 percent
- The percentage of Indian bauxite resources located in Orissa: 50 percent
- The percentage of world's bauxite products in Orissa: 10 percent
- In 1995, 2,466 megawatts of coal-fired power was produced in Orissa and 1/3 of it was consumed by two aluminium smelters: NALCO and INDALCO.
- Aluminium smelters in Orissa consume power equivalent to 515,000 households in the United State of America for one year.
- Ongoing smelter construction by NALCO and others will increase captive coalfired power consumption to 1680 megawatts.

Because of accelerated climate change, which, in turn, is induced by greenhouse gas emissions from aluminium and other industries, the State has been frequently haunted by natural disasters, including cyclones, tornados, storm surges, heat waves and droughts. In 1998, a heat wave resulted in the death of 2,000 people in the State. In 1999, a cyclone of unprecedented severity ripped through the coastal areas, leaving 10,000 people dead and causing extensive damage to

houses, livestocks, crops, infrastructures, tree covers and communication systems. Droughts occurred in 2000 and 2002, followed by bouts of massive flooding in 2001 and 2003. Some of the adverse effects of drought, especially in the Western districts, are migration and increased indebtedness.

The social debt

Dispossession of land and displacement

In Orissa, the entry of Government supported mining companies and other large industries and the construction of multi-purpose power projects have meant the uprooting of thousands of people, many of them Adivasis or indigenous people, Dalits and other marginalised communities, who have been historically dispossessed of their lands. A study points out that in the four undivided districts of the State, namely Dhenkanal, Ganjam, Koraput and Phulbani, over half of the Adivasi land was lost to non-Adivasis over a 25-30 year period. Another study (Fernandes and Raj, 1993, cited in Sainath, 1996) concludes that in Koraput district alone, over 100,000 Adivasis were dispossessed of their land, including 1.6 lakh hectares of forests on which they had depended for their survival. More than six percent of the population of the district, a majority of them Adivasi, were displaced in the process.

Absence of any meaningful rehabilitation programme contributed to land alienation. The State Government followed transmigration schemes for displaced people that actually eroded their cultures and paved ways for their disintegration. These displaced people now live in slum colonies or mainstream consumer-oriented society.

Displaced people living in slum colonies

Loss of sources of livelihood and sustenance

For the Adivasis of the State and others who relied on the forests for centuries, the takeover of their lands for mining, industrial and power generation related purposes in effect deprived them of their means of livelihood. Adivasis have traditionally depended on non-timber forest produces for their sustenance: more than 50 percent of their food came from the forests before their displacement.

The contamination of the State's water bodies, particularly the Brahmani river, due to the effluents released by the mining and other industrial projects, also had profound adverse impacts on the livelihood of the non-Adivasis. About 500,000 people, mainly fishermen and farmers, in 1,800 villages were severly affected. The Brahmani river is the prime source of irrigation and soil nutrition for thousands of farming fields in Anugul, Dhenkanal, Jajpur and Bhadrak districts . But now, the scene has changed. When the flood waters of Bramhani recede, the agricultural fields located in the Talcher region are covered with black residues of industrial effluents. There are reports of damage to seasonal crops and fruit-bearing trees which come in contact with the polluted water. There are even reports of pests becoming resistant to pesticides after coming in contact with the water. In the Damsala basin, harvested paddy and leafy vegetables were found to contain chrome poison. Cultivation of cash crops, such as sugarcane and pulses have decreased considerably due to the polluted water. The volumes of water flowing down stream of river Bramhani has been substantially reduced, following the construction of the Rengali dam, which currently caters to the need of the Anugul-Talcher industrial belt. As a result, pollutants move slowly causing more damage. About 40 years ago, the Bramhani was the lifeline for the inland fishermen of Anugul, Dhenkanal, Jajpur and Bhadrak. However, mining and industrial effluents have adversely affected the breeding and composition of species of fishes, turning fishermen, who since have lost their livelihoods, into daily wage earners or migrant labourers. The pollution of the rivers also affects fish breeding in the mouth of the region and also the mangrove forests in the estuarine zone.

Increase in employment through mining: a myth

One of the government's stated reasons for opening up the mining sector is to generate employment. Reality, however, provides a different picture. From 1990-91 to 2000-01, the output of minerals went up by 121 percent. However, the number of mines in the State decreased by 14 percent, mining areas declined by 11 percent, and the number of workers directly employed fell by 20 percent.

Except in the case of coal and bauxite, the number of workers employed in the mining of major minerals has fallen substantially, while production has gone up, presumably due to increased mechanisation.

Table 2. Production and employment by mineral, Orissa, 1990-91/2000-01

Mineral	Growth in Production	Growth in Mining area	Growth in Employment
Iron ore	71%	11% (-)	17% (-)
Manganese	0%	16%	49% (-)
Chromite	106%	21%(-)	20% (-)
Bauxite	57%	1% (-)	49%
Coal	194%	38%	8%
Graphite	42%	44% (-)	61% (-)
Limestone	67% (-)	70% (-)	96% (-)

Source: Economic Survey, Government of Orissa (various years)

Table 3. Mining area and employment by region, Orissa, 1997-98

Region	Growth in Mining area	Growth in Employment
Anugul	46%	6% (-)
Bolangir	9%	31% (-)
Cuttack	8.5%	0%
Jharsuguda	5%	3% (-)
Kalahandi	3283%	200%
Keonjhar	6% (-)	28% (-)
Mayurbhanj	4% (-)	55% (-)
Nuapada	39%	27% (-)
Sundargarh	1%	11% (-)

Source: District Statistical Handbooks, Government of Orissa (various years)

Thus, while mining has destroyed the livelihood of many communities, who eked out their living through rain-fed farming or collection of forest produces, additionally it has failed to provide any apropriate and meaningful alternative employment. For every one hectare of land that is mined, only 1.6 workers are employed.

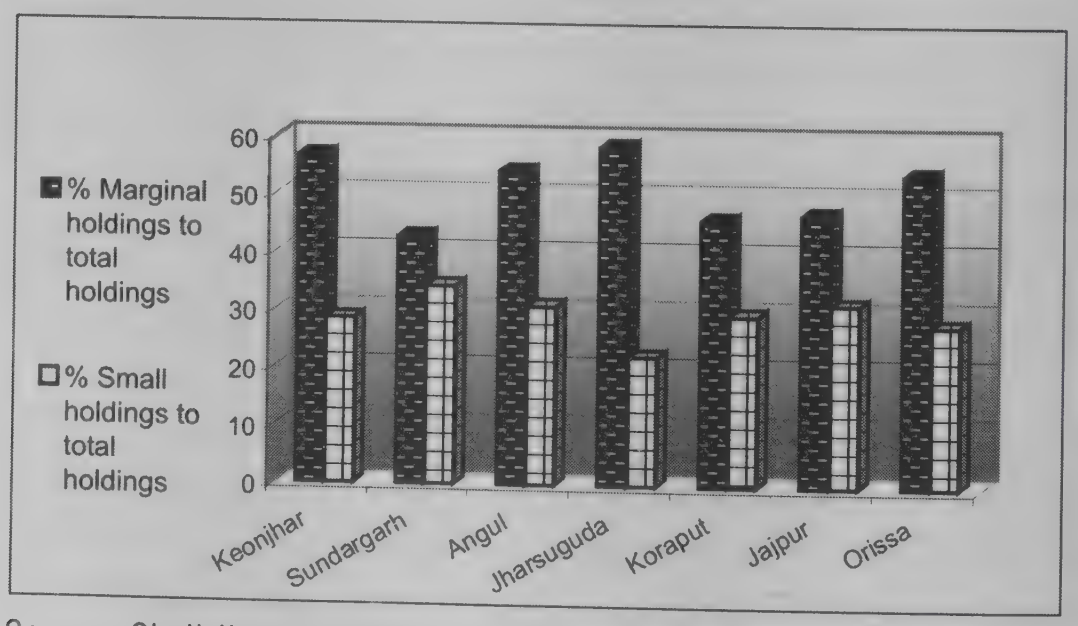
It is important to point out that while the overall employment rates have decreased, the number of informal wage labourers in mining areas has been increasing. Wage labourers start working at an early age (perhaps 15 years old), endure hard work, brace accident-prone workplaces and continue in sub-human living conditions (i.e. slums). Ridden with health problems, their average life span fluctuates in between 40 and 45 years (less than both the national and State averages). The provision of minimum wage, gender-equitable wage, housing, health, education, training and recreation services to wage labourers are simply avoided by the employers..

Heightened poverty

Perhaps, not surprisingly, the districts of Orissa having most of the mines, such as, Jajpur, Keonjhar, Dhenkanal, Anugul, Jharsuguda and Sundergarh, Mayurbhanj and Koraput are also the poorest districts in the State. Against the State average of 38 percent, Dalits and Adivasi population in these districts range from 29 to 62 percent, while the marginal and small farmers constitute 76 to 85 percent (state average 82 percent).

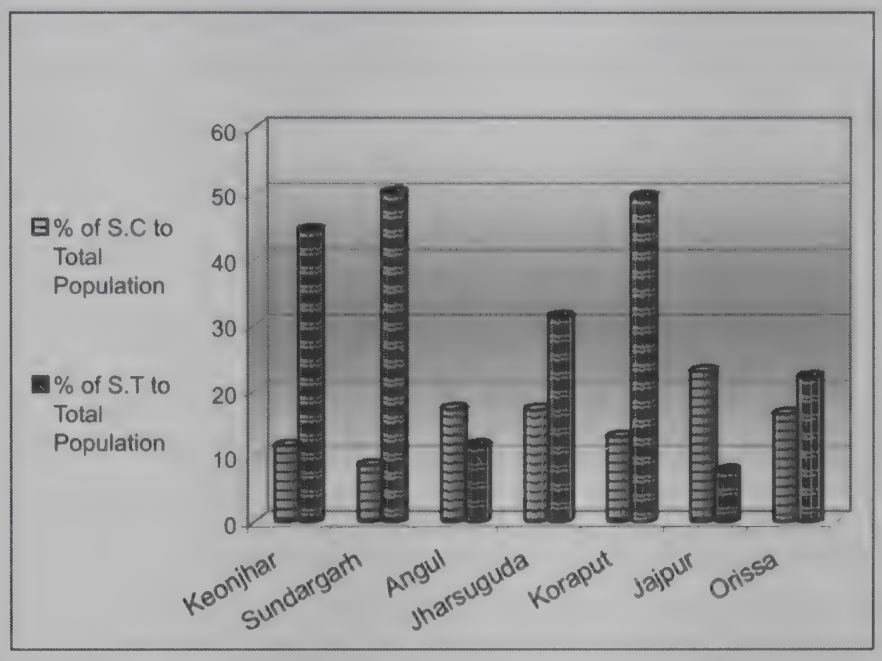
Against the state average of 66 percent, families living below the poverty line (BPL) in the most mined districts, range from 49 to 85 percent. Adivasi and Dalit families in these areas are found to be 44 to 82 percent of the total BPL families of the State (Orissa Development Report 2002).

Figure-7 Position of marginal & small land holdings in mineral rich districts of Orissa (in number)



Source:Statistical abstract, Government of Orissa (2005)

Figure -8 Position of SC & ST in mineral rich districts of Orissa



Source: Statistical abstract Goevernment of Orissa (2005)

Adverse effects on health

The impact of mining on the health of communities is conspicuous. The average life expectancy of the people of Orissa is below the national average in mining areas. Mining workers usually work for no more than 15 to 20 years. The infant mortality rate is also higher than the non-mining areas. Lack of safe drinking water, provision of housing and long working hours (10 to 12 hours) per day impose additional strains on women, who have dual responsibilities in

Residue of ash mud in local streams

Skin diseases due to exposure to effluents from Nalco, Damanjodi

the household and workplace. In particular, the polluted Brahmani river and its tributaries have made skin diseases, malaria, tooth diseases, eye infection, fever, jaundice, intestinal and stomach problems very common in the areas of Kamakhyanagar, Parajanga, Dhenkanal Sadar, Bhuban and the Gondia block of the Dhenkanal district as well as in Damasala, Rasulpur, Bari, Sukinda, Danagadi and the Binjharpur blocks of Jajpur. Reportedly, 85 percent of patients in government dispensaries in this region, suffer from stomach and skin diseases.

Mining has accelerated destruction of forests . Therefore, the loss of precious herbal plants used by indigenous people as medicine and the resultant disuse of traditional health practices of indigenous people are strongly linked. Until recently, in every Adivasi village there was a Baida (traditional medicine person) providing cost effective treatment for various ailments.. But as the medicinal plants decreased, the Baidas are slowly shifting to other occupations. Health services provided by public sector companies have been limited to mostly regular company employees only. Many private mining companies are violating their statutory health obligations to low rung workers and the local communities. Unorganised contract workers, especially women and child labourers, have no option but to depend on government-run public health centres, the conditions of which are notoriously poor due to shortage of doctors, health workers and infrastructure facilities.

Documented impacts of mining on health

- Chromium and hexavalent chromium, which have contaminated Orissa's food chain, are toxic and exposure to either of these compounds lead to inflammation and irritation of eyes, peptic ulcers as well as irritation of respiratory tracts and nasal passages. Hexavalent chromium is known to adversely affect women's health in particular.
- Coal dust pollution of air, water and land affects respiratory health in coal mining areas of Orissa, which covers about two hundred villagers in six blocks of three districts. Burning of coal for refining and thermal power, produces flyash which contains sulphur.
- Red mud, which is produced when bauxite is processed into alumina and which contains iron oxides, silica, zinc, phosphorus, nickel, among others, causes skin diseases.
- A number of studies and surveys have established that mining workers and communities living around mining areas are exposed to silica.
- There is also increased incidence of tuberculosis among the mine workers of Orissa.

Summary

Mining and related industries, including power projects - which are being promoted vigorously by the Indian Government and the Government of Orissa for higher revenue generating and to accelerate development have imposed huge ecological and social burdens on the local communities in Orissa, especially on the Adivasis.

Starting with the rooting out of tens of thousands of people from their sources of sustenance, contamination of water sources, air and land; the onslaught extends to ill health and shorter life span. The cost of all these comprises the general ecological debt owed to the local communities of the State. In the following part of the study, a closer examination is made about the case of one mining and aluminium company which could serve as a generalisation for other such concerns, as well.

LUCC

IV

NALCO'S ECOLOGICAL AND SOCIAL DEBT

NALCO's bauxite mine, alumina refinery and aluminium smelter plant

The National Aluminium Company Ltd. (NALCO) is an integrated multi-locational aluminium complex that was incorporated in 1981 as a public limited company to exploit large deposits of bauxite, discovered in the Eastern Ghats in Adivasi areas of Orissa in Koraput. While bauxite ores in India are harder and have a higher stripping ratio when compared with that of its Australian counterpart, the rich content of aluminium makes the Indian bauxite ore attractive for aluminium refining. NALCO's bauxite reserves of 370 million tons are expected to last for at least 75 years at the current mining rate of 4.8 million tons, per annum. The low silica content of India's bauxite makes it possible for NALCO to produce high quality aluminium at low cost.

The authorised capital base of the Company is Rs.1300 million. The original project cost, which includes the construction of the refinery was partly financed by external commercial borrowings from a consortium of international bankers, French credit facilities and additionally, partly by equity subscribed by the Government of India. The entire foreign currency loan, totaling to US $ 1.755 billion, has been repaid as of 30 September 1998 and NALCO claims at present that it is a "zero debt-company" except for the debt created out of equity subscription.

Technical know-how and basic engineering requirements for the project were made available by AP International of France. Since 1985, NALCO operates a

fully mechanised open cast bauxite mine in Panchpatmali, with a capacity of 4.8 million tons per annum. It feeds raw ore to the alumina refinery plant in Damanjodi, which churns out alumina, the fine white powder that goes into the making of aluminium metal at the aluminium smelter faciltiy in Anugul.

The Growth of the Aluminium Industry

Globally more than 40 nations produce aluminium. But only about a third of them perform each step in aluminium production - mining the bauxite, refining the ore, and smelting the alumina. Some countries import bauxite and then refine and smelt the alumina. Some, import alumina but not the bauxite.

India is one of the countries that perform each step in aluminium production. Of the world's leading producers, only Australia and Russia produce a major portion of their bauxite requirements.

Aluminium production soared during the First World War. In the 1920's the methods of turning aluminium into useful products continued to boost production. The Second World War brought tremendous expansion in its production. After the war, the aluminium industry developed many products that have since become commonplace. The demand for aluminium has grown steadily with the continuing development of new uses for the metal.

Several bauxite mining countries have joined together to form the International Bauxite Association (IBA). The Association was formed in 1974 to increase revenue from bauxite mining amongst the member countries. About 75 percent of the deposits lie in countries that belonged to IBA.

Sources of Aluminium

Most minerals, rocks, and soils contain aluminium compounds. But aluminium only be made inexpensively only from bauxite. Bauxite is the name for any ore that has a large amount of aluminium hydroxide. Most bauxite ores consists of 30 to 60 percent alumina and 12 to 30 percent water. It also contains iron oxide, silica, and titanium oxide. The darker the colour, the more is the oxide contents. The riche deposits of bauxite are found in tropical and near-tropical regions. The leading bauxite mining countries include Australia, Guinea, Jamaica, China, India, Venezuela and Brazil.

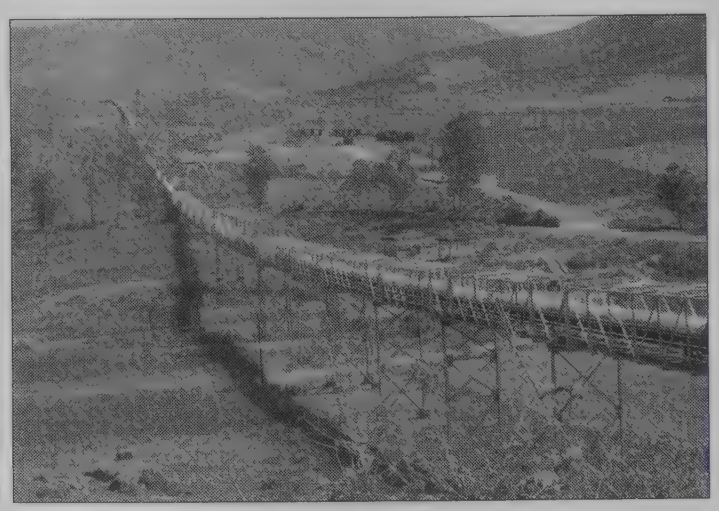
Nalco Alumina refinery, Damanjodi

Nalco captive power plant, Damanjodi

Built in 1986, the refinery has three parallel streams with a capacity of 525,000 tons per annum each, producing 886,000 tons of alumina powder in 1999- 2000 for the Company's smelter at Anugul; out of which, 479,620 tons were exported to overseas markets, mainly France, through the Visakhapatnam Port. NALCO has completed the expansion of the aluminium refinery by upgrading capacity from 800,000 tons to 1,050,000 tons to meet the envisaged capacity level of 1,575,000 tons.

The refinery has a captive power plant with a capacity of 55.5 megawatts as against its actual need of 32 megawatts. For captive power generation, coal is mined elsewhere in Orissa (Dhenkanal district), displacing thousands of people and causing severe environmental degradation. When NALCO was first established, power was derived from a major hydroelectric power project which submerged 57 villages and displaced more than 50,000 people. Earlier, the refinery's "red mud" and ash ponds were earlier large land tracts used by indigenous people for subsistence farming. Water for the refinery plant is drawn from the Upper Kolab reservoir, which is about 8 km away from the plant.

Nalco mining area in Panchpatmali hills, Damanjodi



Nalco mine to refinery conveyor belt, Damanjodi

With a capacity of 345,000 tons per annum, NALCO's aluminium smelter has been in operation since early 1987. Presently, the capacity is being expanded to 460,000 tons per annum. An export-oriented rolled products unit is set up to produce foil stock, can stock, cable wraps, standard sheets, coils and other aluminium products. The smelter plant has a captive power plant containing six units of 120 megawatts. Coal, amounting to 3.5 million tons per annum, is supplied to the captive power plants from the Talcher coalfields of Mahanadi Coal Limited (MCL).

Aluminium: where it comes from, where it goes

Aluminium production consists of three processes: mining the bauxite, refining the bauxite to alumina, and smelting alumina to make aluminium. In India, producing a ton of aluminium requires two tons of alumina and each ton of alumina needs three tons of bauxite. These processes are inexpensive in India compared to international standards due to multiple factors. One, Indian bauxite is less impure, which translates into lower power consumption in smelting; two, Indian bauxite is available close to the surface, which makes extraction easier and cheaper; and, finally, electricity and, most crucially, labour in India is relatively cheap. Mining bauxite in India costs a quarter of the world average and production of aluminium is 25-30 percent cheaper.

Huge bauxite reserves, one billion tons, were unearthed in Orissa and contiguous parts of Andhra Pradesh in 1995, making India a fairly significant player in the bauxite and aluminium market, worldwide. India currently has about three billion tons of known bauxite reserves, the fifth largest find in the world, nearly 60 percent of it laying in Orissa. India's aluminium production - over seven lakh tons in 2003 - comfortably meets the domestic demand and 1.65 lakh tons are currently exported. India's aluminium demand - 6 lakh tons in 2004, or 0.6 kilograms per person per year - is very low compared to 15 kilograms in Japan and 25-30 kilograms in the US and Europe.

Over half of the aluminium produced worldwide is consumed by the packaging industry and transport sector. Aluminium is also used hugely in making defence weaponry and aircraft. In the coming years, more of the Indian aluminium will be exported which is expected to jump six-fold to a million ton a year by 2010. This will intensify with the entry of big foreign companies having wider links to globalised production processes and markets.

Source: Peoples Union for Democratic Rights (PUDR-2005)

NALCO is one of the producers of aluminium comparatively having lower costs mainly on account of access to low cost captive power (due to cheap source of coal) and the high quality of its bauxite ore. The cost of power works out to be Rs.0.5 per kilowatt-hour (US $ 1.1 cents) as opposed to US $ 2 cents per kilowatt-hour for the low cost fossil fuel based producers in the Middle- East.

Nalco power plant , Angul

NALCO's ecological debt

Pollution of rivers and streams: Overflowing "red mud" and ash pond

NALCO's bauxite and alumina refinery leaves a toxic residue known as "red mud". This by-product, whether it is dumped into the mining areas or sealed ponds, percolates into the soil. During the field visits, it was observed that the "red mud" pond of NALCO's alumina plant did not have the obligatory impervious lining, that prevents the "red mud" from seeping into the soil, indicating that the contamination of ground water is a certain possibility.

NALCO 'red mud' pond, Damanjodi

NALCO ash pond, Damanjodi

Moreover, the huge power requirements of the NALCO plant are met by coal based power stations. The generated ash is dumped into a separate ash pond. Villagers have complained that whenever it rains, both the toxic 'red mud' and ash ponds overflow to spill into their streams, rivers and farm lands. Indeed, on 31 December 2000, a severe breach in the ash pond occurred. This is in sharp contrast to the solemn statements of the State Pollution Control Board that heavy monsoons would not lead to an overflow of the ponds ('The Sambad' Oriya daily, January,2001 various editions). NALCO's bauxite refinery releases waste water into Kolab river by a drain passing through nine villages. Futhermore, fluoride dust from NALCO's aluminium smelter in Angul pollutes water bodies within a five kilometre radius in nearby 30 villages in the vicinity.

Accident: Breach in NALCO's ash pond

On 31 December 2000, a breakdown of NALCO's 800 acre ash pond in Anugul created an "ash flood" (equivalent to a flow of 4055,000 metric tons of ash) that covered the shores of Nandira river. Down stream, in the district of Jajpur, five lakh people in 166 villages were affected by ash floods in the Brahmani and Kharasrota rivers. Ten villages in Anugul district were submerged, affecting a total of 773 families in 23 villages. More than 50 cattle were washed away and hundred of acres of standing crops were destroyed. NALCO provided minimal compensation of Rs.30,000 per acre for lifting ash from lands. A total of around Rs. one million was disburshed that included Rs.46 lakh to 630 persons towards the destruction of crop and Rs.6.5 lakh towards damage to houses.

Source: ("The Sambad", Oriya daily, January, 2001 various editions

Climate change

Bauxite refining and production of aluminium are a cause of rising temperature because of high requirements of electricity met by the thermal power generation facilities. Every ton of aluminium produced by NALCO generates 12-18 tons of carbon dioxide (equivalent to 9,000 times the normal level) and 0.5 kg of tetrafluoromethane, which is up to 9,500 times more potent than carbon dioxide as a global warming agent.

NALCO's social debt

Dispossesion of land and displacement

NALCO is located in the so-called "Schedule V" area for which land acquisition

neccessiates special permission. Invoking the infamous Land Acquisition Act, the Company acquired around 10,000 acres of land - much more than what it required .In fact more than 60 percent of the land so obtained has not been utilised in the last 25 years by the Company. Under the grab of public purpose, lands of the indigenous peoples were acquired for a throw away market price. According to one estimate, around one lakh Adivasis were deprived of their land, including 400,000 acres of forests which they relied on for their livelihood and sustenance. The villages in the surrounding area had depended on the forests for many of their needs including food, especially during the lean seasons. More than 70 villages had used the area for hygienic needs and the collection of fuel, house building and thatching materials, etc.

NALCO's land acquisition

To set up the mines and refinery complex, the Company had acquired 10,059 acres of land, out of which 4,352 acres were private lands. Out of the 10,059 acres of land acquired, 427 acres were for mines, 2,639 acres for a township and 6,993 acres for the plants. Government lands accounted for 41 percent, for which no compensation was paid. Another 41 percent lands were fertile agricultural field.

On behalf of NALCO, the State Government issued the first notification for land takeover at Damanjodi on 12 August 1981 in the Orissa Gazette Extraordinary. In many such previous cases the time lag was usually five to ten years, between the first official announcement and the final acquisition of land. A total of Rs.148,73,474.52 was paid as compensation for Patta land alone. No compensation was paid for community property resources (CPR) or Government and village land, upon which landless villagers depended for subsistence farming and other needs.

Initially, displaced people agitated against the project itself. However, NALCO had promised the displaced villagers, decent jobs and good relocation for resettlement, including money for their land. Slowly the displaced people settled down to demanding for the promised reparations. The agitation persisted for several months until some of the demands were met. The project authorities compromised only with the affected villagers who were most active in the agitation. These communities were shifted out to a new area. Probably, without any agitation, these displaced people would not have received any compensation at all.

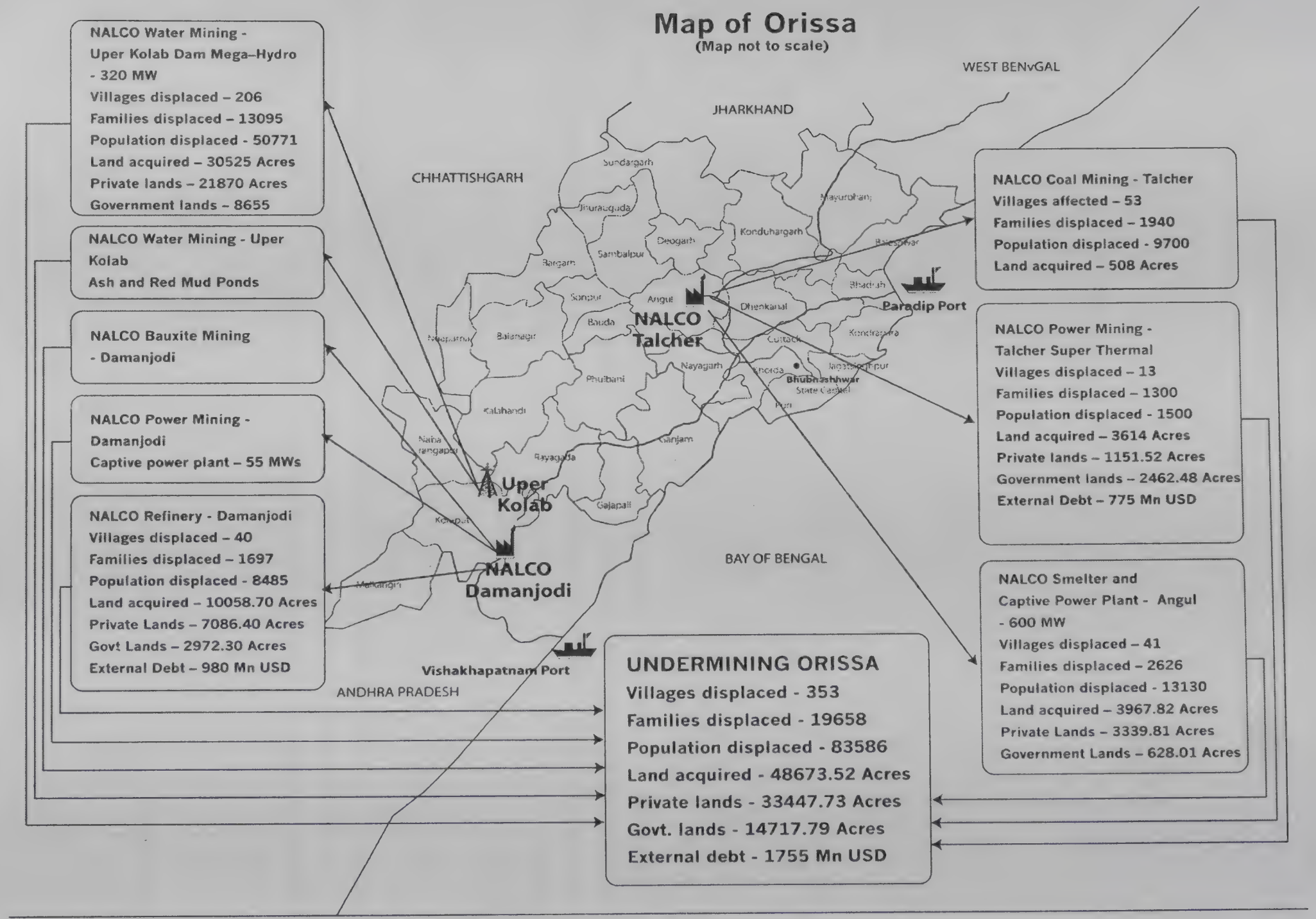
Out of 597 families, initially ousted from Damanjodi, 441 were relocated in the Analabadi colony, for which Analabadi villagers were additionally deprived of their land. Some 352 families were offered one job each, especially in low

paid positions (e.g. drivers, diggers). Of these, 35 were Dalits; 149, Adivasis; and 168 belonged to other castes. Only eight of the employees were women. Many of these employees eventually lost their jobs in NALCO in a couple of years due to lack of training. Overall, every family consisting of 5-15 members received a paltry sum of Rs.3000/acre, one house consisting of one and a half rooms, but no farmland at all.

At the rehabilitation colony, the supply of drinking water was inadequate. NALCO provided only three wells for more than 500 families. People built two more wells out of their own resources. They complained that in the dry season the water situation worsened, as the water in the wells dried up. Before displacement they used the spring water in their villages freely, which was enough to satisfy their daily requirements for both domestic and agricultural purposes.

While no exact data exist, it is estimated that NALCO's overall operations since its establishment in Koraput district in 1981 displaced some 353 villages comprised of 19,658 households or 83,586 persons. Dam and power projects related to the mining and aluminium complex, namely the Upper Kolab Dam and the Talcher Super Thermal Power Project, displaced 13,095 and 1,300 families, respectively, or some 52,271 persons, more than 50 percent of them belonging to the scheduled tribes or castes. The construction of NALCO's refinery in Damanjodi and smelter in Anugul directly affected 81 villages displacing 4,323 families or around 21,625 persons. Finally, the Company's coal mines dislodged around 53 villages with a total of 1,940 families or 9,700 persons.

There was only a primary school in the rehabilitation colony. To continue their education, students had to travel long distances to reach other schools in the region. Most of the displaced families living in the colony could not afford the costs involved in such long distance travel of their children, which impaired their children's chances of securing good jobs in the future. Not only the displaced villagers lost their lands and homes,but aslo failed to receive adequate compensation in terms of decent jobs, proper shelter facilities or any worthy human resource development inputs from NALCO. Finally, the resettlement area did not make provision for traditional Adivasi places of worship (sacred groves) and last rites (e.g. cremation or burial grounds). It stiffled the previously existing needs of Adivasi councils by denying them appropriate forums to transact traditional chores. As a consequence, the Adivasi structural support, based on traditional culture is fast disappearing. Needless to say that during the entire displacement and rehabilitation process, NALCO did not


Map of Orissa
(Map not to scale)
WEST BENvGAL
JHARKHAND
CHHATTISHGARH
Sundargarh
Jharsuguda
Sambalpur
Deogarh
Bargarh
Sonpur
Bauda
Balasore
Phulbani
Kalahandi
Nabarangapur
Rayagada
Gajapati
Konduhargarh
Mayurbhanj
Baleshwar
Bhadrak
Angul
Dhenkanal
Cuttack
Nayagarh
Khorda
Bhubaneshwar
State Capital
Puri
Ganjam
Kondhamala
Jagatsinghpur
NALCO
Talcher
Paradip Port
Uper
Kolab
NALCO
Damanjodi
Malkangiri
BAY OF BENGAL
Vishakhapatnam Port
ANDHRA PRADESH
NALCO Water Mining -
Uper Kolab Dam Mega–Hydro
- 320 MW
Villages displaced – 206
Families displaced – 13095
Population displaced - 50771
Land acquired – 30525 Acres
Private lands – 21870 Acres
Government lands – 8655
NALCO Water Mining - Uper
Kolab
Ash and Red Mud Ponds
NALCO Bauxite Mining
- Damanjodi
NALCO Power Mining -
Damanjodi
Captive power plant – 55 MWs
NALCO Refinery - Damanjodi
Villages displaced – 40
Families displaced – 1697
Population displaced - 8485
Land acquired – 10058.70 Acres
Private Lands – 7086.40 Acres
Govt Lands – 2972.30 Acres
External Debt – 980 Mn USD
NALCO Coal Mining - Talcher
Villages affected – 53
Families displaced – 1940
Population displaced - 9700
Land acquired – 508 Acres
NALCO Power Mining -
Talcher Super Thermal
Villages displaced – 13
Families displaced – 1300
Population displaced - 1500
Land acquired – 3614 Acres
Private lands – 1151.52 Acres
Government lands – 2462.48 Acres
External Debt – 775 Mn USD
NALCO Smelter and
Captive Power Plant - Angul
- 600 MW
Villages displaced – 41
Families displaced – 2626
Population displaced - 13130
Land acquired – 3967.82 Acres
Private Lands – 3339.81 Acres
Government Lands – 628.01 Acres
UNDERMINING ORISSA
Villages displaced - 353
Families displaced - 19658
Population displaced - 83586
Land acquired - 48673.52 Acres
Private lands - 33447.73 Acres
Govt. lands - 14717.79 Acres
External debt - 1755 Mn USD

Endangered Sacred Grove, Damanjodi, Koraput

cosult the affected people and communities or took step to involve them in decision making processes directly, relating to their life and living..

Loss of sources of livelihood and sustenance

Even as the displaced people, primarily Adivasis, were not justly compensated for the loss of their lands, including community property resources; the forests, on which people depended for non-timber forest produces that sustained them especially during the lean months, has drastically dwindled in the project areas. Although NALCO has an environmental regeneration scheme for planting of trees (particularly species of commercial value), it is notaccessible to the people as fences have been erected around them.

In the traditional village society, those castes groups which did not own land were also an integral part of the rural socio-economic system, providing a variety of services to the community, and relying on reciprocity and common property resources for their subsistence . These factors were not taken into consideration by NALCO, in calculating compensation. Impoverishment of various categories of the displaced population therefore, was an obvious consequence.

According to the local communities impacted by the projects, contacted for the study, pollution generated by NALCO's refineries and smelters have had the following negative consequences on agriculture, the major source of livelihood of the people.

- Drop in harvest in 300 acres of cultivable land due to the poisoning effect of the effluents
- Germination problem for millets, ginger and tumeric

High on Industry Low on Living Standards

The undivided Koraput district has a total area of 26, 961 sq. km., of which 2, 000 sq. km. have been occupied by a consortium of big industrial houses. The majority of its population (56 percent) are Adivasis , which is 24 percent of all the Adivasis in the State. Dalits and Adivasis together form 80 percent of the aggregate population of the district. It is one of the four demarcated mineral rich zones in Orissa, is the home to the Kondh, Paraja, Gadaba and many other Adivasis, including the primitive Bonda. The district has 18 large projects and about 500,000 acres (2,000 sq.km) of its total area of 26,961 sq.km (or 7.42 percent) have been occupied by these projects. The ventures are Machakund, Balimela, Indravati and Upper-Kolab (irrigation and power), HAL (defence), J.K & SEWA (paper), Mangalam Timbers, IMFA (ferro silicon), NALCO, L & T, Aditya Birla and UTKAL (alumina/bauxite), etc.

In some of the large-scale projects; countries like Norway, Sweden, France, Russia, Germany, Japan, America, Canada, Netherlands and Australia are either directly or indirectly involved.

In the undivided district, the nuber of displaced population is about 2,50,000. About 400,000 acres of forest, which was one of the primary source of livelihood of the local population has already been lost. While only 38 percent of the villages are having power connection, the rate of literacy stands at 24 percent and 70 percent of the families who live below the poverty line. The indicators of quality of life like literacy, life expectancy, employment, health are low among the displaced people which mostly comprises of Adivasis and Dalits.

- Damage to stored potato, turmeric, ginger, arum, among others, due to increase in temperature
- Loss of cattle and goat heads due to pollution induced dysentery
- Damage to 800 and 500 acres of paddy crops in Tulasipaland Languliabedha, respectively due to poisonous fluoride leaks on 29 October 1999 and 13 September 2004 (Angul)
- Damage to teak, mango, eucalyptus and other crops in Kulada, Gadarkhai, Tulasipal and Banda because of gas leak on 02 August 2005. Adverse effects on human health (Angul)
- Local communities complain that NALCO's ash pond is responsible for a damp environment, creating a breeding ground for mosquitoes. Incidence

of malaria has increased in the villages in the vicinity of the ash pond. It has also been found that villagers living the surrounding of NALCO's aluminium smelter in Angul suffer from brittle bones, tooth and gum diseases have developed skin lumps and other symptoms of fluorosis. Before the establishment of the smelter plant, flourosis did not occur in these areas.

Impact on women

Adivasi women were disproportionately affected by the social and environmental burdens wrought by NALCO's mining and mining related activities. Traditionally, women have the responsibility to collect non-timber forest produces, food, fodder, fuel and water for their families. Many women have reported an increase in domestic work hours because of the disappearance of the forests and the contamination of water sources, resulting out of NALCO's activities. It is now more difficult and time-consuming for women to perform these routine tasks. The takeover of Adivasi land by the NALCO project also meant a decrease in women's (already limited) cash income since, women are no longer able to sale extra farm produces in the markets, thereby increasing their economic dependency on men, which undermines their social status. In the resettlement areas, provided by NALCO, displaced women are unable to get skilled jobs because of low level of literacy and continued discrimination against them in the formal labour market. It is basically rooted in patriarchal middle-class and upper caste views that women's role is limited to the home. While NALCO initially promised one job per displaced family, it was mainly offered to the male members. The absence of sanitation and hygiene facilities in resettlement areas also caused problems mainly for women, who to begin with required greater privacy than men. Aslo, there are reports of increased incidence of violence against women, as families attempt to cope with the emerging tension and disruption caused by displacement and a new economy . Alcohol use is aslo rampant. Overall, Adivasi women have lost their independence and dignity in such a chaos. The changed culture in the resettlement areas only legitimises the denial of economic opportunities for women, forcing them to remain at home or restricting their work to unskilled, very poorly compensated jobs. It is not unknown for Adivasi women to starve themselves in order to feed the rest of their family members which in fact happened here.

Summary

NALCO, one of the biggest bauxite mining and aluminium companies in the country, is a award winning export-oriented company that has been hailed as bringing development to the region. However, a closer look at it reveales that NALCO broke many of its promises made to the local communities , affected by its activities and by taking away their lands and forests, there by destroying sources of livelihood as well as underminining their overall health and well-being. It can be said, therefore, that NALCO owes a tremendous ecological debt particularly to the tens of thousands of people who suffered total displacement as a result of the Company's operations.

V

FORTHCOMING BAUXITE MINING AND REFINERY PROJECTS

Aside from NALCO, few forthcoming bauxite mining and refinery projects are being planned for the State, such as Vedanta, Sterlite and UAIL ventures.

The Vedanta project

Vedanta Aluminium Limited (VAL), a wholly owned subsidiary of the London based Vedanta, is putting up a one million ton refinery plant at Lanjigarh in Kalahandi district. On 07 June 2003, VAL entered into a memorandum of understanding with the Government of Orissa to build an aluminium complex, comprising an aluminium refinery plant, a three metric ton bauxite mining facility and a 75-megawatt capacity captive power plant. Mining will be conducted in a forest area of 672,018 hectares, situated in the Niyamgiri Reserve Forest areas and the Protected Forest area of the Rayagada Forest Division. The project would also cover over 26 hectares of village forests. According to a report released by the Orissa based Environmental Protection Group, bauxite deposits are located in the upper portion of the hills in Niyamgiri that effectively acts as overhead aquifers. Mining of bauxite in this area will therefore, destroy the aquifers. Moreover, the Dongaria Kondhs, one of Orissa's most distinctive tribes, live in 90 small hamlets that dot the Niyamgiri range. The project will spell doom for the tribe whose habitat fall under the aluminium plant area.

The Sterlite project

The Sterlite project, which is situated in a "Schedule V" area, runs counter to the spirit of the Supreme Court ruling that not only prohibits sale of such land,

government or private, to the non-Adivasis, but also bars mining leases or prospective licenses to mining companies. However, the State performed a legal sleight of hand by arguing that the transfer of land for development activities, establishment of industries and operation of mining leases in these areas would bring about encouraging socio-economic development of the Adivasi population. Sterlite's proposed mining site holds some of Orissa's most biodiverse forests, with an impressive crown density of over 40 percent. It is home to the endangered Royal Bengal Tiger apart from leopards, sambars, bisons and a host of other species. Streams and springs sprout on Niyamgiri's northern ridges, giving birth to Vansadhara, the only river of the region. There is an urgent need for conservation here (Devarajan, 2004).

The UAIL project

The Paraja and Kondha Adivasis, living in the Kashipur block of Rayagada district in Southwest Orissa are being asked to give up their land to make way for mining of bauxite by Utkal Aluminium International Limited (UAIL). The Government of Orissa in 1993 for this purpose, entered into a contract with the private Company, which today is a consortium of Alcan of Canada and Hindalco of India. The venture is 100 percent export oriented. UAIL plans to mine bauxite from the Baphlimali hill in the area using fully mechanized bauxite mining techniques to recover 195.73 million tons of bauxite. Local communities in Kashipur stand to gain little tangible benefits as employment opportunities would be extremely limited because of fully mechanised operation. Cash compensation will be provided to those who are defined as "project affected" as well as 10 cents of land and a house of 300 square feet. Many of the villages which would lose up to 75 percent of cultivable land, will not even be considered as displaced areas, rendering the villagers virtually landless. The proposed compensation package is insufficient for the loss of livelihood and the manifold effects on ecology. A detailed independent economic, social and environmental assessment on the project shows that the requirements of 2,610 hectares of land for the factory wastage dump will cripple the livelihood of most of the settlements in the valley (TARU, 1996)

At least 11 villages downstream to the refinery, with a total population of more than 2,000 people will be affected by the project's "red mud" discharge (Das , 2001). The project is also expected to generate 1000 tons of ash per day that will be dumped into an ash pond which, according to the environmental clearance given by the Government, need not be serviced by the Company for the first five years of its operation. It is feared that the overburden will be dumped on the slopes of the mining area, contaminating the cultivable lands and local streams.

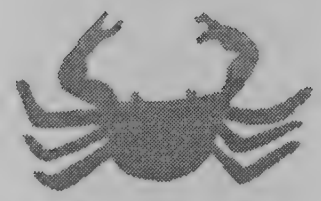
According to Das (2001), the state of Orissa will receive royalties of about Rs.42 per ton of bauxite or Rs.12.6 million a year and some returns in terms of taxes from the project. However, the State has also incurred a loan of more than Rs.300 million for the construction of a railway line linking the bauxite route to the port, and another loan of more than Rs.900 million from the World Bank to provide power to project.

"Hills are the very core of our existence. We cannot survive without them," says a resident of the area. Though the forest region has depleted over the years, there is still enough left to sustain the region's 70- odd villages. Kutrumali, a huge mountain the company plans to mine, has forests covering around 10-15 percent of the plateau top. Whatever is left of the forest resources, after being plundered by the state government's commercial activities, is crucial for the Adivasis' food security during the dry months."(Down to Earth, April 15th, Vol. 7 No.22)

Summary

Many more companies are interested in setting up mining and related operations in Orissa. Meanwhile, environmental impact assessment studies for Tata- INDAL have yet to be completed. Other companies in the mining race such as Larsen and Toubro, Vedanta, Aditya Birla and Sterlite have already acquired leases for vast tracts of land in Rayagada and neighbouring Kalahandi and Koraput districts and are awaiting authorisation from the Ministry of Forest and Environment to go ahead. However, if one clear lesson that can be drawn from the experience with NALCO, it is this- should additional mining and industrial projects be pushed through, these will surely increase the ecological debt owed to the local communities.

VI



CONCLUSION

Synthesis

After India's independence in 1947, Orissa became a direct target for economic expansion through the exploitation of natural resources by corporate mining activites and hydropower projects. The principal actors in the ensuing large-scale destruction of ecological space in Orissa include the national corporations primarily NALCO, trans natinal companies such as AP International of France, Norske Hydro of Norway, Alcan of Canada, BHP of Australia, Alu Suisse of Switzerland, Rio Tinto and Alcoa of America, G7 countries that are major consumers of aluminium and the World Bank. They are the debtors of an ecological debt owed to the people of Orissa.

In pursuit of growth, based on a neoliberal development paradigm, in an era of heightened economic globalisation, India's Central and State government policies favoured increased foreign investment in mining and related industries and have significantly relied on the exploitation of domestic mineral resources for export - at the expense of the environment and local communities. In Orissa, the laws that exist specifically to protect the Adivasi communities, their livelihood and land are being constantly flouted. There have also been many recent attempts to relax such protective legislation (e.g. amendment to the Land Acquisition Act in 1998, amendment to Schedule V in 2001, amendment to the Land Transfer Act in 2004, and amendment to the Forest Bill in 2005). Apart from these retrograde efforts, the Central and State governments have also framed anti-people policies on water, agriculture, education, health and employment in order to facilitate profitable corporate activity in mining and other industries. In the case of Orissa, the State has signed over 35 memoranda of understanding, committing the State's approximately

40,000 lakh tons of iron ore reserves for mining. What was normally meant to be exploited over a period of 200-300 years shall now be emptied within a quarter of a century. Moreover, the State has incurred a massive amount of debt for the construction infrastructure primarily use of the business interests..

Following the Climate Convention Protocol signed by most of the world's Governments at the 1992 Earth Summit in Rio de Janeiro in Brazil, the developing countries of the Southern hemisphere were given lead time to "develop their economies" before they reduced greenhouse gas emissions contributing to global warming, while rich countries were given notice that their emissions would soon have to be reduced dramatically. The latter responded by funnelling massive quantities of capital, via their corporations, governments and the World Bank, into fossil fuel-driven power plants in the South and by moving energy-intensive industries to the South, including India and Orissa in particular. Despite India's commitment at the Climate Convention, greenhouse gas emissions in Orissa have skyrocketed. Orissa's industries and coal-fired power plants currently emit 164 million tons of carbon dioxide.

As a result of these developments, mining activities in Orissa have pushed out at least 80,000 people, mainly Adivasis, from their land in the name of development and progress. The new mining projects are expected to dislocate at least another 100,000 people. In general, the process of displacement reinforces and aggravates societal divides based on class and gender. Marginalised people, whose only wealth might be a small plot of land must now endure global warming-induced fluctuations in rainfall, ash overburden and effluent loads that harm agricultural lands and destroy farm produces. They are forced to live with scarcity of water as water, from rivers are diverted for industrial use and also rendered unusable by pollution. They are no longer able to fall back on the forests that looked after their subsistence needs during the lean months. The lands and forests are closely interwoven with the Adivasi inhabitants' livelihood practices, culture, wisdom, dignity and sovereignty. As these are distorted by the corporations with the aid of the Government, the Adivasi way of life is in danger . All of these constitute an ecological debt owed to the people of Orissa, especially, the Adivasis.

Resistance

Notwithstanding the onslaught on their environment, livelihood, health and culture, it is important to note that the people of Orissa are not merely victims.They are alert enough to stall the advancement of the destructive corporate interests. From experience, they have ealised the direct and indirect consequences of mining and allied industries. Therefore, in the last two decades, Orissa has witnessed many

mass struggles for protection of life and livelihood of people.For example, the affected people at Baliapal, Gandhamardan, Chilika, Indravati, Gopalpur, Kotagarh, Lakhari, Kashipur, Lanjigarh, and Kalinga Nagar have flared up to assert the rights of the communities. Common to all these struggles is that a large section of small peasants, Adivasis, Dalits and women were involved in demanding sustainable living avenues for them and an end to the unsustainable practices of vested mining and industrial interests. Sustained mobilisation has helped in stalling future large-scale mining initiatives by both the State and corporations. It clearly depicts the ongoing conflict over control of resources between communities and corporations, often backed by the Government.

While these struggles are legitimate movements, the Government has nevertheless termed it "anti-development" and "anti-national". Protestors have been imprisoned or killed. On 2 January 2006, police opened fire on hundreds of Adivasis demonstrating against mining projects in Kalinga Nagar. Twelve Adivasis were killed and about 30 were seriously injured. The people connected with the movement believe that the police acted on the instructions of mining interests with the unofficial backing of the Government.

Adivasi rally in Bhubaneswar, capital of Orissa for rights over land, water and forest

What kind of a development path?

Government actions against the so called "anti-development" protests against mining or anti-people policies and actions of the vested interests increasingly prove that "development" is no more a concept concerned with the marginalised people. Under the current neoliberal thinking, it has become an ideological garb to disguise the appropriation of people's resources by private capital. What is not admitted is concerned with the ecological debt, owed to people. Thus, there is a need to examine the so called development oriented projects, which consume tremendous amount of resources, at the expense of the environment and society and to ensure that genuine development accrues to people.It is the one and only test that all business ventures, especially mining and allied industries must pass.

Ecological debt: the chicken and egg story

A few decades back, moneylenders in Koraput exploited the Adivasis to the hilt. They used to employ a number of tricks. For example, one Adivasi might go for a loan of a chicken to the moneylender to treat a guest. The moneylender would decline to give a chicken but would offer an egg instead in the presence of a number of 'witnesses'- pillar, log, house, goat sun, etc.

A few months after, the moneylender might go to the Adivasi while he was busy in his fi eld and demand a few hundred rupees to be paid immediately against the 'egg loan', and may even ask for the land as an alternative payment option. The Adivasi would be crestfallen, but the moneylender would explain: If you had not taken the egg, I would have hatched it and it would have given many more chickens, and thus many more eggs. Just imagine the cost! Since you are a good person, I'm not asking for the full cost !".

If the communities are left with their eggs, owned by them to hatch as they please, they would indeed create more chickens, and more eggs. If the communities could be given back their resources to utilize on their own terms, they could sustain themselves - as they have done for thousands of years. At the moment, however, corporations are killing all the chickens, and eating all the eggs too. The long-term ecological debt is incalculable. But if we do not try to arrive at an estimate then, the debt will continue to remain invisible. Even if reparations could potentially lessen the ecological debt, these will never truly compensate for the pillaging of resources in Orissa and elsewhere, or the destruction of people's traditional ways of sustaining themselves and their communities.

Perhaps any solution to ecological debt will have to come from the indigenous communities for its success. People visiting these communities quickly notice the individuals who live a lively and full life, replete with a deep sense of community committment and also by taking prudent advantage of their few resources. Their culture celebrate and venerate nature for its abundance, bounty and generosity. Their lifestyles too are an ode to simplicity with gratitude for the mother nature.

10060

Martyrs of Kalinga Nagar massacre on 02-03 January 2006: 12 Adivasis were killed in police firing

Moreover, as concerned citizens of Orissa, along with the affected comunities, continue to come forward to resist mining and mining-related industries it is important to ask a fundamental question: what development trajectory or paradigm would benefit best under the emerging circumstances ?

This study is a prelimnary attempt to begin to understand the emerging concept of ecological debt from the perspective of Orissa. Future studies on ecological debt in Orissa might propose mechanisms for measuring ecological debt, particularly vis-à-vis a country's financial debt. The future studies might also suggest legislation for calculating, restricting and compensating for the impact of ecological debt. It is important to point out that while it is impossible to completely compensate for the destruction of the environment, people's livelihoods and ways of life, some corrections may have to be made in terms of control and use of the resources, fixing accountability and sanctions on the institutions involved in the accumulation of ecological debt. A cost-benefit analysis of environmental and social concerns and suitable mechanisms of governance to ensure community participation and leadership in decision making processes on development have to be evolved. The way forward therefore entails demonstrating alternatives to the neo-liberal paradigms, policies and legislations which entails research, advocacy, lobbying, networking and alliance building. to ensure a world that free of ecological debt.

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Orissa Fact Sheet

- Total population: 36,706,920; Rural population: 31,210,602
- Landmass: 1,55,707 sq. km.: 4.74 percent of India's landmass
- Decadal population growth: 15.94 percent
- Density of population per square kilometer: 236 persons
- Sex ratio: 972, Rural: 986, Urban: 895
- Rate of literacy: 63.6 percent, Male: 76.1 percent , Female: 51 percent
- Adivasi: 22.21 percent ; Literacy rate 22.31 percent
  Dalit: 16.20 percent; Literacy rate 36.38 percent
- Workers: (Cultivators, agricultural labourers, household industry and others): 38 percent
- Cultivators: Rural : Percentage to total workers: 33.22 percent, male-39.61 percent, female-20.48 percent
- Agricultural labourers to total workers: 39.12 percent; Male: 30.20 percent, Female: 56.91 percent
- Per capita income: Rs.6105; Per capita State debt: Rs.6692
- Families below poverty line (below Rs.11,000 annual income): 48 percent; Adivasis under BPL: 86 percent of total Adivasi population
- Marginal and small farmers: 82 percent; Per capita cultivation area: 0.17 ha.
- Forest cover: 30.21 percent of the geographical area. Dense forest, 16.74 percent of the geographical area.
- Irrigation potential created: 33 percent of the cultivable land

Profile of Major minerals:

Mineral	% to National reserve	Life span at present rate of extraction
Chromite	97	38 years
Bauxite	50	310 years
Iron ore	34	120 years
Manganese	25.5	166 years
Coal	24	857 years

Undivided Koraput district

- Mega projects: 18; area occupied by mega projects: about 2000 square kilometres; displaced population: about 2,50,000
- Villages electrified:38 percent, rate of literacy:24 percent; families living below poverty line:70 percent

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